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Synthetic Time Setting in a Jobbing Foundry

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Western Editor, The Iron Age

A METHOD by which production time can be set synthetically for orders received in a jobbing foundry has been developed by the Link-Belt Co., Chicago. A series of charts, based on actual time studies, provides the necessary information for each step in the production of a given casting. The data are assembled on an "observation sheet" for the guidance of those in charge of production.

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SYNTHETIC time and motion study is a term used at the Pershing Road (Chicago) plant of Link-Belt Co. It pertains to a set of charts which in the hands of a competent time study man enables him quickly and accurately to tabulate the time required for any job that is to go on the steel foundry floor. These charts, or graphs, which have been tested for a number of years, apply to floor molding only. If a helper is needed, an allowance of 75 per cent of the molder's time is made. The character of the work performed is that of a jobbing foundry.

Each chart is based on actual time studies, and the graphs are plotted with time against either the cubic contents of the flask or its area. In the early part of this work it was found that neither volume nor area would give reliable results in every case. So the method that would give the most dependable results was adopted.

For the most part flasks in this foundry are standardized in sizes ranging from 20 in. to 84 in. in diameter and having 6, 7 and 8-in. depths. All are fitted with trunnions.

The man who uses these graphs and the observation sheet has had 14 years of experience in the foundry and has had 10 years of actual time study experience. The Link-Belt Co. considers these prerequisites as essential because in working up the time the observer must visualize and thoroughly understand each foundry operation. It is reasonable to expect that in the wide diversity of work there are factors that require some modification based on expert judgment of the man working up the time. For instance an allowance of 10 to 20 per cent is made for fatigue.

The first duty of the observer in making use of the charts is to go into the foundry and get from foundry foremen the size of flask to be used, number of cores and their sizes, and the number of gates and risers. After making a personal check of the pattern he returns to the office, where by means of the graphs he makes up an observation sheet.

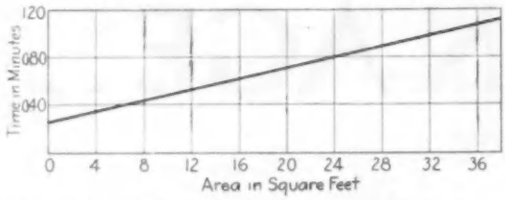
He has before him a tabulation showing the area and volume of the various standard flasks. With this information available he can turn, for example, to the first graph and for a flask of 7.07 sq. ft. area find that the time allowance for leveling the floor is approximately 0.40 min. This time is then entered on the observation sheet, the numbers on which correspond to the numbers on the graphs.

If necessity dictates the use of rectangular flasks the observer must make extra allowances in the time because of the use of spreader bars.

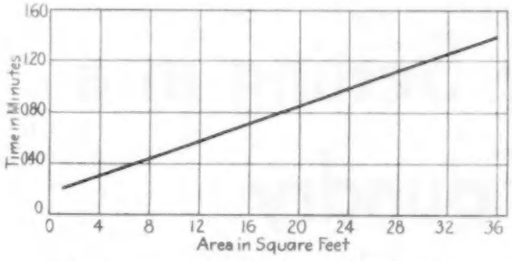
Allowance is made in graph No. 3 for setting the drag by hand or by crane. If the latter method is used, there are two curves, one for round and one for rectangular flasks. In the case of the example mentioned above it was necessary to block the drag and the observer had to make an allowance. Instead of the 1.20 min. obtained from the graph he allowed 2 min. On graph No. 4 extra allowances are indicated for setting and drawing hubs and prints and for placing wedges under arms of gear patterns. From this graph it is found that for a 7.07 sq. ft. flask the time allowed for setting the pattern by hand is about 0.45 min. and since there is one hub an extra 0.70 min. is allowed making the total 1.15 min. However, here the observer marks down 1.20 min. because it is the usual

This table gives areas in square feet and volumes in cubic feet of various sizes of standard flasks.

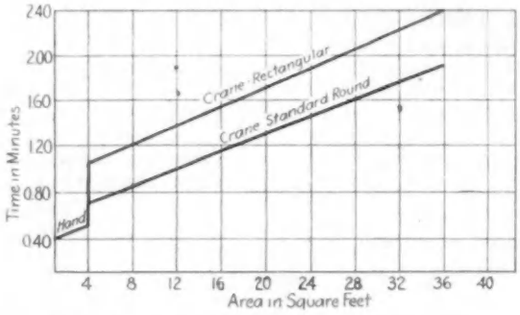
Size of Flask	Area in Sq. Ft.	Volume in Cu. Ft. 6″	7″	8″
20″	2.2	1.10		
24″	3.07	1.57	1.83	2.10
28″	4.28	2.14	2.49	2.85
32″	5.59	2.79	3.25	3.72
36″	7.07	3.55	4.13	4.71
40″	8.73	4.36	5.08	5.81
44″	10.56	5.28	6.16	7.03
48″	12.57	6.28	7.33	8.38
54″	15.77	8.00	9.30	10.60
58″	18.35	9.15	10.70	12.20
62″	21.60	10.40	12.20	14.00
66″	23.75	11.44	13.35	15.26
72″	28.00	14.14	16.49	18.85
		8″	10′	12″
84″	36.00	25.50	32.00	



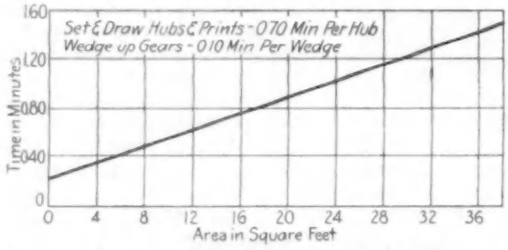
No. 1. This graph gives the time for leveling the floor. The basis is the area of the flask.



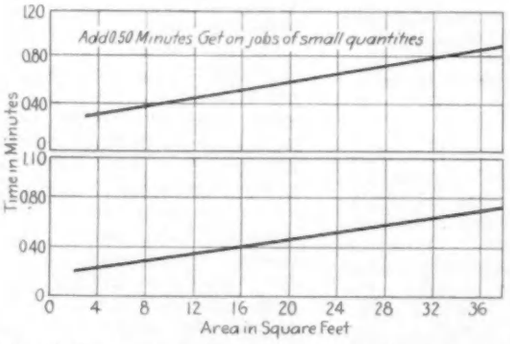
No. 2. Time allowance for setting a board.



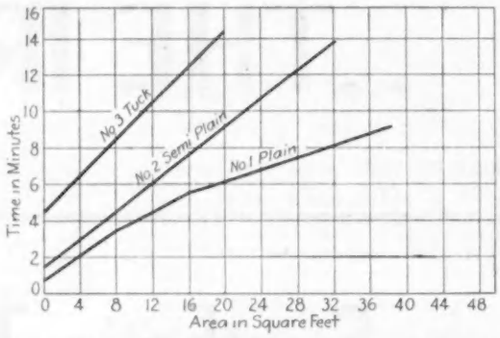
No. 3. Time required for setting drags either by hand or by crane. Extra time is allowed for setting rectangular drags.



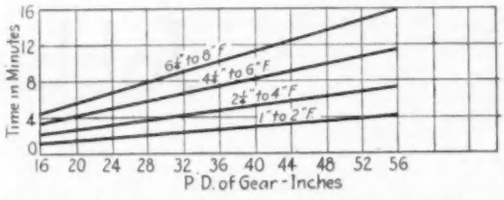
No. 4. This graph covers setting patterns by hand with extra allowances for setting and drawing hubs and prints and wedging up gears.



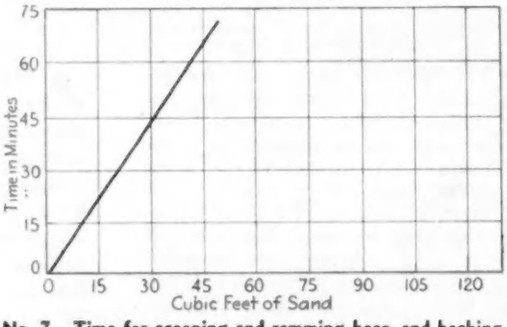
No. 5. These curves, No. 1 (lower) and No. 2, provide for the use of kerosene or parting sand. On jobs of small quantities extra time is allowed for obtaining kerosene.



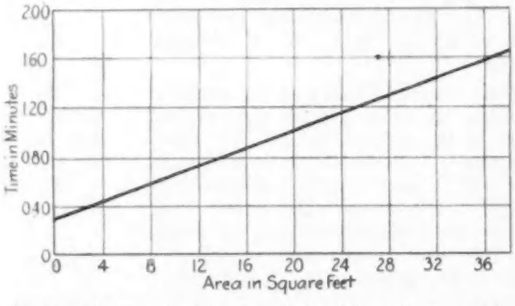
No. 6. Time allowed on plain, semi-plain and difficult jobs of facing copes and drags.



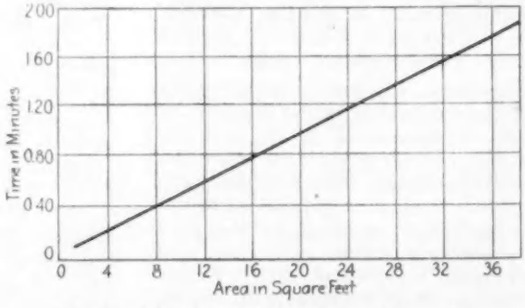
No. 6a. Allowances for facing teeth of cast steel spur gears are based on pitch diameter and width of tooth face.



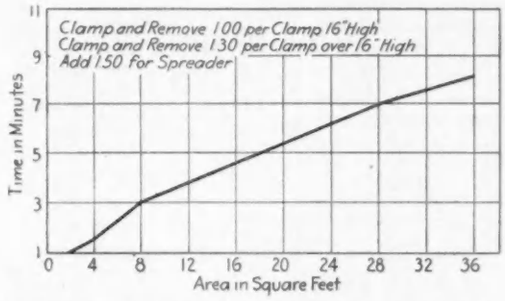
No. 7. Time for scooping and ramming heap and backing sand is based on the cubic contents of the flask.



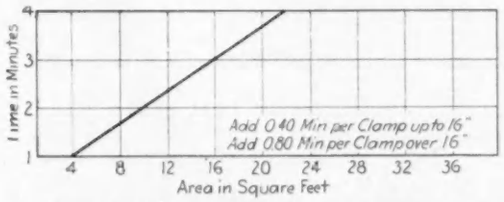
No. 8. This graph gives time for striking off drag with a shovel.



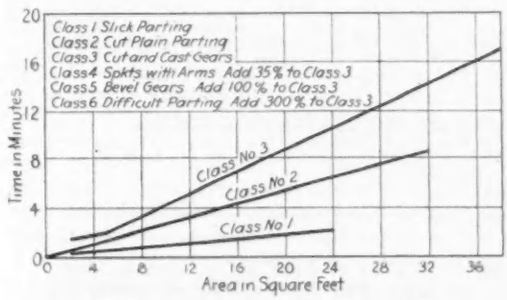
No. 8a. Time for striking off drag with a stick.



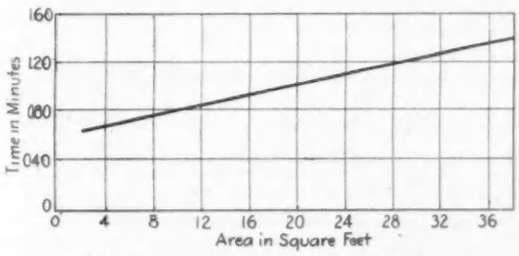
No. 9. Time allowance for leveling board, clamping and rolling over, and removing clamps and board, with extra time if spreader is used.



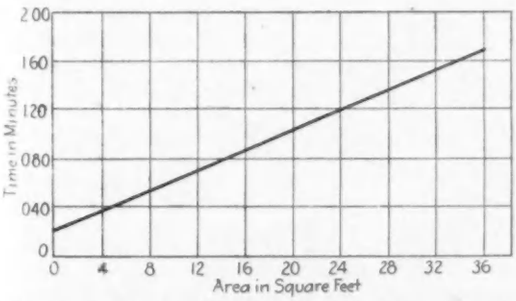
No. 9a. Time for clamping, rolling and removing clamps (Thompson clamps), and when the cope flask is used as a drag.



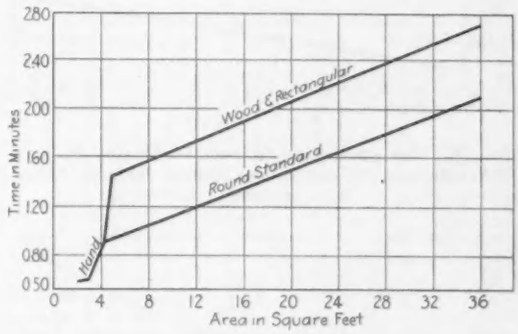
No. 10. Time allowance for six classes of parting.



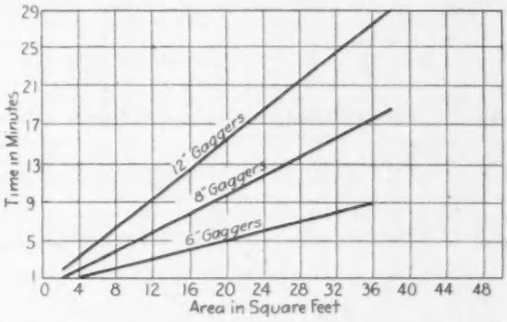
No. 11. This graph gives the time for blowing the drag after parting.



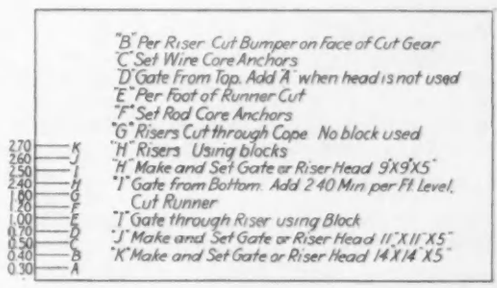
No. 12. Application of parting sand is based on the area of the flask.



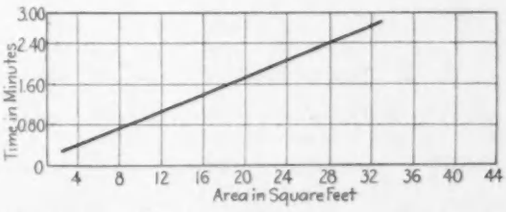
No. 13. The time for setting copes is taken from this graph. It is also used with drags when mounted patterns are required.



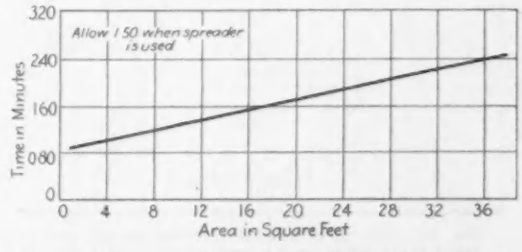
No. 14. Gaggers are standardized in 6, 8 and 12-in. lengths.



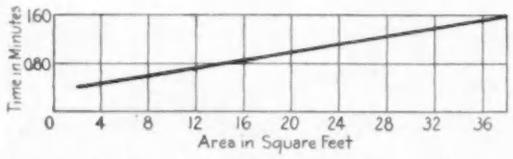
No. 15. This chart shows time allowances on gates and risers.



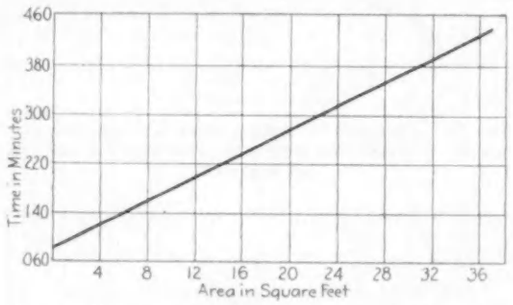
No. 16. Time for striking off cope by means of a shovel.



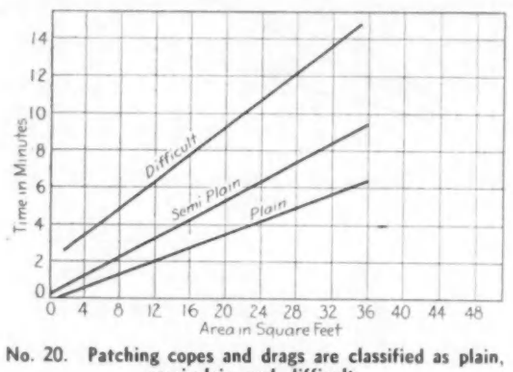
No. 17. Time for lifting cope, rolling and setting on horses, with extra allowance when spreader is used.



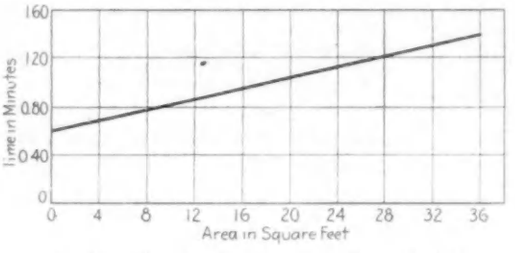
No. 18. This graph gives the time for blowing the drag before drawing the pattern and blowing the cope before patching.



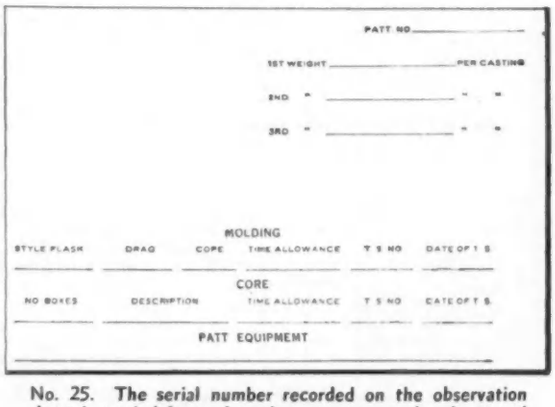
No. 19. Time allowance for rapping and drawing a full pattern.



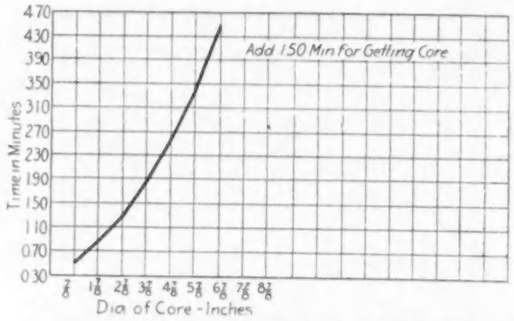
No. 20. Patching copes and drags are classified as plain, semi-plain and difficult.



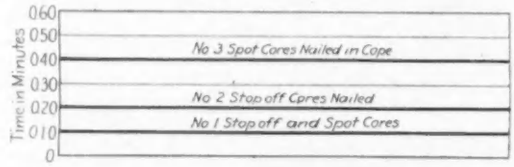
No. 21. Time for blowing drag after patching.



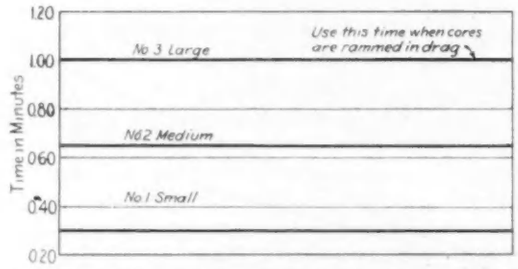
No. 25. The serial number recorded on the observation sheet is carried forward to the pattern record and entered under item "T.S.No."



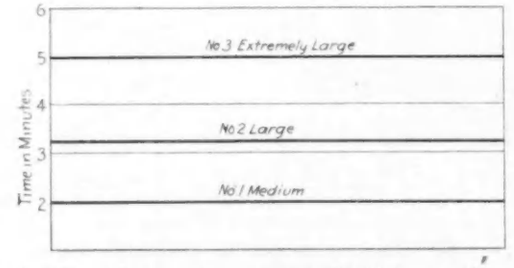
No. 22. Time allowance for cutting, tapering and setting stock cores, with extra time permitted for getting cores.



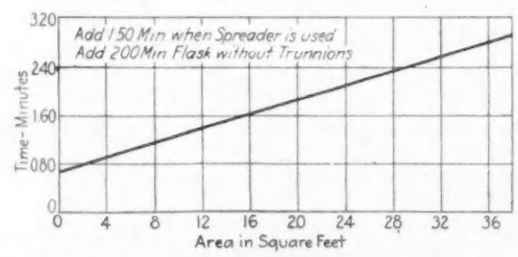
No. 22a. Standard times are permitted for the three classifications of core setting.



No. 22b. Cores set by hand are classified as small, medium and large. Line No. 3 is used when cores are rammed in a drag.



No. 22c. Cores set by crane are classified as medium, large, and extremely large.



No. 23. This graph gives flask closing time with allowances for use of spreader and flasks without trunnions.

LINK-BELT COMPANY

OBSERVATION SHEET

OBSERVER'S NAME [illegible] MACHINE No. STEEL FLOOR DATE 2/14/32 19

WORKMAN'S NAME AND QUALIFICATIONS 1039 COPE 6"

MADE IN 36" Flask Lift & Roll. Gate from Hub-2 Risers on Rim DRAG 16"

PIECE C 33746 C.S. Dble Edge Rollers

AREA 7.07 SQ. FT. VOL. 12.97 CU. FT.

	DETAIL OPERATIONS		CONTINUOUS TIME	INDIVIDUAL TIME
1	LEVEL FLOOR		40	
2	SET BOARD		40	
3	SET DRAG	Block	200	
4	SET PATT.	1-Hub	120	
5	PARTING SAND		30	
6	FACE	COPE AND DRAG	320	
7	SCOOP AND RAM		1800	
8	STRIKE OFF		30	
9	LEVEL BOARD, CL. AND ROLL		280	
10	PARTING		200	
11	BLOW		70	
12	PARTING SAND		50	
13	SET COPE		100	
14	SET GAGGERS		350	
15	GATES AND RISERS		1370	
16	STRIKE OFF		60	
17	LIFT COPE		120	
18	BLOW		60	
19	RAP AND DRAW		450	
20	PATCH	COPE AND DRAG	420	
21	BLOW		80	
22	SET CORES		540	
23	CLOSE		110	

MIN. TIME IN MIN. 66.30

\+ 10% 6.63

TOTAL TIME IN MIN. 72.93

TOTAL TIME IN HRS. 1.2

BASE RATE

RATE SET

— Gates & Risers —

F = 120

4x5 = 1000

2x7 = 250

1370

— Cores —

Set Cores 250

1-3" Stack 290

1-2238 ... 100

5.40

MINIMUM TIME

No. 24. This sheet is filled in by the observer. He must obtain necessary signatures on it before the sheet can be placed on record.

practice to add a fraction of a minute to a two place decimal fraction so that it will always end with a zero.

Graph No. 5 is drawn in two parts, one for use when kerosene is needed, with an allowance of 0.50 min. for the molder to obtain the kerosene on a small lot job, and the other part for figuring the time needed for parting sand. No. 6 is drawn to cover three conditions of applying facing sand, riddling and tucking. No. 6a is for spur gears requiring deep riddling and tucking. The curves are based on the pitch diameter of the gears.

Graph No. 7 is based on the cubic feet of sand in the mold and No. 8 and No. 8a (strike off with shovel or with stick) return to the basis of the area of the drag. The observer found two clamps necessary when computing the time from graph No. 9. Graph No. 9a would have been used if cross bars were in the cope and a bottom board was not to be used. Class No. 2 was used on graph No. 10. With a time allowance from graph No. 12 for sprinkling parting sand the drag time was completed.

Graphs Nos. 13 to and including 23 give the time in making up the cope. No. 13 is used also for drags when mounted patterns are specified. No. 14 is based on the average number of gaggers per square foot. This basis was found to give more consistent results than the cubic foot basis. The time for gates and risers was taken from graph No. 15 and was computed in detail in the lower left hand corner of the observation sheet. The observer reduced the strike-off time as given by graph No. 16 and on No. 17 he increased the time taken from the curve so his figures would be in tenths instead of hundredths as read from the graphs.

The curves on graph No. 20 are explained as follows: "Plain" refers to flat cope rammed on a bottom board. "Semi-plain" is illustrated by the use of an upset pattern. "Difficult" refers to a cast tooth gear, full pattern, etc. The details of computing core setting time are taken from graphs Nos. 22, 22a, 22b or 22c, as the character of the work demands. In the case at hand the details are shown in the lower right hand corner of the observation sheet.

After these figures are taken from the graphs the time for the detail operations is totaled and is recorded on the observation sheet as "minimum time in minutes." To this is added 10 to 20 per cent for fatigue and personal allowances, the percentage added being a matter of the judgment of the observer. The total time is then reduced to hours, against which is applied the base rate, which is the amount of money a man is supposed to earn while doing piece work. The base rate is predicated on the average hourly rate. When working on piece work a man should earn from 30 to 40 per cent more than when on a straight day rate.

Next the observer rubber-stamps the observation sheet so that he can record the signatures of those who are responsible for the entire job. The purpose of this is to prevent "buck-passing" and to place full responsibility on all those concerned. The observer signs his name, as does the man in charge of the time study department. Other signatures that must be obtained are those of the foreman on the job, the foundry superintendent and the plant superintendent.

The observation sheet is then given a serial number, by which it is later filed as a permanent record. This serial number is carried forward to the pattern record card, which also shows the date of the time study.

Scrap for Steel Making

The large proportions to which the steel scrap business has attained was emphasized by Dr. George B. Waterhouse, professor of metallurgy at the Massachusetts Institute of Technology, Cambridge, Mass., in the Howe memorial lecture which he delivered at the recent annual meeting of the American Institute of Mining and Metallurgical Engineers in New York. He discussed "Steel Making Processes" and pointed out that one of the main factors in the steady growth of the basic open-hearth process had been the use of scrap "which at present is the cheapest raw material in the steel industry. . . In normal times 200,000 people are employed in its collection, preparation and classification. Accurate figures were obtained by the census in 1929, when 29,500,000 tons of scrap were used in steel making with an estimated value of $450,-000,000.

"It is estimated," continued Dr. Waterhouse, "that 750,000,000 tons of steel are in use in this country, so that there is a great potential amount of scrap for many years."

Precision Machining in Surgical Sc

PRODUCTS of ingenious mechanical design frequently have had to await progress in metallurgy and machining before they could be commercially manufactured. This was the case with surgical scissors with renewable cutting edges, designed in the plant of the Bard-Parker Co. at Croton Falls, N. Y. In addition to the problem of delicate and accurate machining, there were the difficulties of heat treating without distortion and of descaling without pitting.

Briefly, the scissors consist of forged stainless steel shanks or handles which carry renewable sharpened steel cutting edges in tiny milled grooves. The shanks are precision-machined and when assembled are pivoted about a hardened stainless steel screw. Stainless steel was adopted for the shank chiefly because this portion of the scissors is used over a considerable period of time and should be capable of resisting corrosion under all ordinary conditions.

The material for the renewable cutting edge, on the other hand, which is at present made from carbon steel, is chosen primarily for its qualities as a cutting edge, as it is expected that the edge will be replaced because of dullness long before it could be destroyed from corrosion. Under ordinary circumstances there is no difficulty in easily removing the edges from the shanks.

Shanks Are Cold Forged

The general scheme of design of scissors and cutting edges may be judged from the drawing (Fig. 1), but the many difficulties in manufacture are not apparent at first glance. Stainless steel strip is purchased to accurately specified dimensions so as to regulate flash in the first forging operation. This is a highly desirable feature in view of the unusual cold forging operations which follow. It means, however, that a different size strip is needed for each size of scissor shank. The cold-working reduction sequence has been developed only after a great deal of experimental work and much difficulty with tiny cracks and rough edges. The problem involved the design of dies, the study of annealing and descaling, and the control of the physical characteristics of the stainless steel.

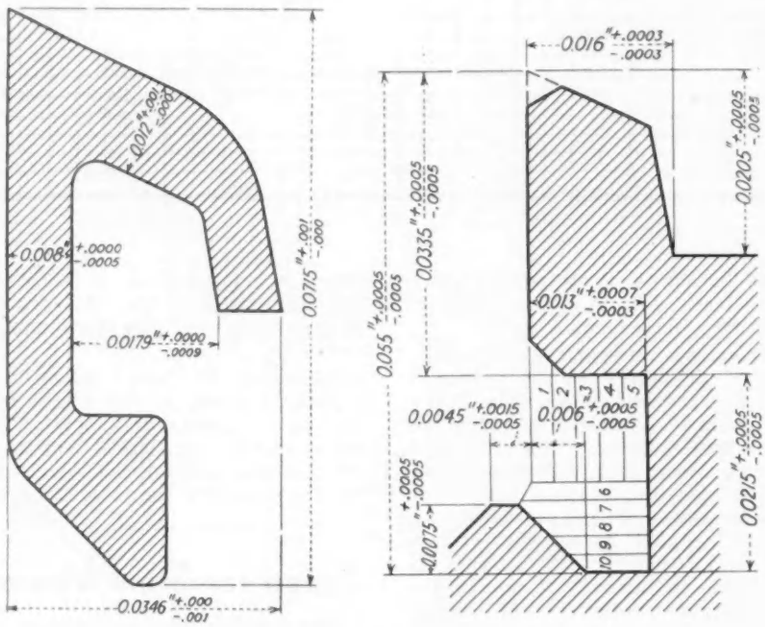


Fig. 1. Enlarged sections of shank rail and cutting edge

Chrome Content Important

The alloy finally selected for the shanks contains about 0.10 per cent carbon and from 12 per cent to 13 per cent chrome. Manganese is held from 0.30 to 0.50 per cent and the sulphur is relatively high in order to give better machining properties. The sulphur ranges close to 0.30 per cent. It is important to keep the chrome content below 13 per cent, as otherwise the edge will not harden satisfactorily through heat treatment. The difficulty of specifying the exact chrome content desired was overcome by ignoring the chemical analysis altogether and specifying performance under stated conditions, thus leaving the problem of analysis up to the steel manufacturer.

After each reduction the parts are annealed. The reducing operations are elaborate and consist of a combination of cold forging and cold upsetting. After each anneal, every trace of the annealing scale must be removed from the surface of the metal to prevent any of this scale from being pressed into the shank during the next cold forging. If this is not done, the scale will spoil the surface of the shank and, once spoiled, it cannot be restored by subsequent forging or final polishing.

After trimming, the shanks follow through a long sequence of special machining operations. The first is to pierce the eyes. Next comes rough milling; then a hole is drilled for the pivot screw. This drilled hole is precision-finished and, from this point on, all of the important operations are gaged from the hole and from a point on the back and near the tip of the shank. This insures accurate alinement and proper action of the scissors. The projection that is later to be grooved to form the rail for the cutting edge is rough-milled on the outside. Later in a special ten-stage rail milling machine this projection surface is finish-milled simultaneously with the cutting of the rail groove.

Milling Minute Grooves

The rail groove, or rail, as it is called at the plant, is an example of extreme precision in a Lilliputian field. Ten cuts are taken with tools which must be thin enough to clear an opening 0.013 in. in width. This is done on the semi-automatic machine shown in Fig. 2. The ten successive cuts to produce the rail are roughly indicated in Fig. 1 and the tolerances are so close that a toolmaker's measuring microscope is required to check dimensions. Several earlier types of machine preceded this final development, which was built by the company in its own shop. Success came only when a machine weighing more than 2500 lb. was used to give ruggedness and freedom from vibration while making the almost microscopic cuts.

Surgical Scissors Production

By HERBERT R. SIMONDS

INTO each contact edge of a pair of stainless steel scissors the Bard-Parker Co. has cut a dovetail groove and into these grooves has slipped hard steel renewable cutting edges to produce a precision instrument for surgical use. The extremely small dimensions and the need for unusual accuracy involved in this new design of scissors have created problems which have taxed the ingenuity of machinists and metallurgists. In machining the groove, 10 separate cuts are required, with tools thin enough to clear an opening 0.013 in. in width. To form the cutting edge, 12 passes in a rugged roll stand are needed. Descaling operations are performed by the Bullard-Dunn process, heat treating of the scissor shanks is in a Bellis liquid bath, and the cutting edges are heat treated by a continuous process.

In milling, the shanks are placed one at a time in a jig which is moved forward successively into contact with each of the ten cutting tools. These tools are mounted on a horizontal turret which is automatically revolved one-tenth of a revolution between each stroke. The indexing cam which may be seen at the top of the machine is designed so that each roller slot for a space of about ¾ in. at its outer end follows a true radius and thus brings the cam to a dead stop before the roller leaves it. This means that the indexing pin also comes accurately opposite its recess with no necessity for beveling and with no wear on the edges. From the rail milling machine the shanks move on to other machining operations. In one of these a notch is cut to form a locking shoulder for the cutting edge.

Fig. 3. The rugged character of the roll stand is indicated. The operator at the left is using a toolmaker's measuring microscope to check the cross sectional dimensions of the wire

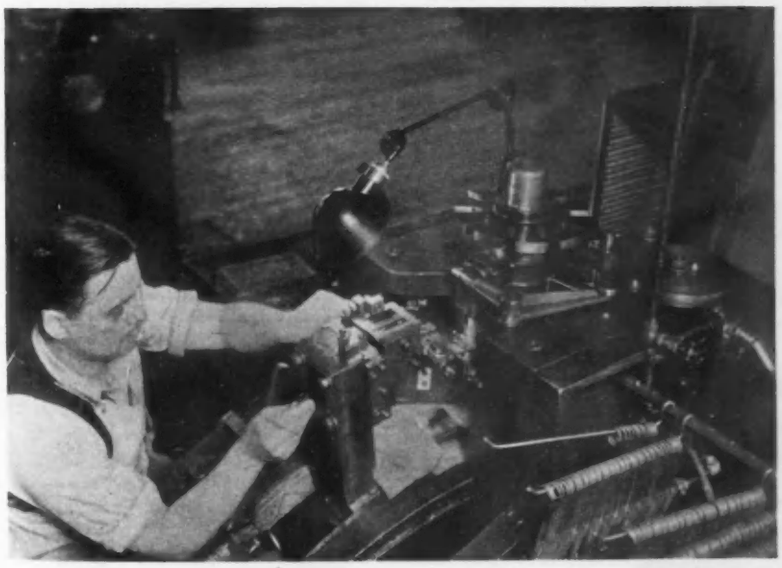


Fig. 2. A specially designed turret machine weighing more than 2500 lb. is used for cutting the tiny rail grooves

Tempering and Descaling

After the shanks are finish-machined they are heat treated through a special salt bath process developed by the Bellis Heat Treating Co. This particular liquid bath process was selected because experiments indicated that its carefully controlled uniform temperature would result in a minimum of distortion of the shanks. The liquid medium, which is heated by its own resistance to the electric current passing through it, has a melting point of 1300 deg. F. and is stable to temperatures above 2000 deg. F. It is neutral to the work, neither carburizing nor decarburizing. The work is therefore heated to its required 1825 deg. without any surface effect, such as would occur in the gaseous atmosphere of an oven-type furnace.

The heat cycle has been carefully scheduled to give the required physical properties. The actual heating of the bath is secured by the passage of a heavy current between two electrodes immersed in the pot. Thus there are no other resistors, and heat loss due to radiation is very low. The

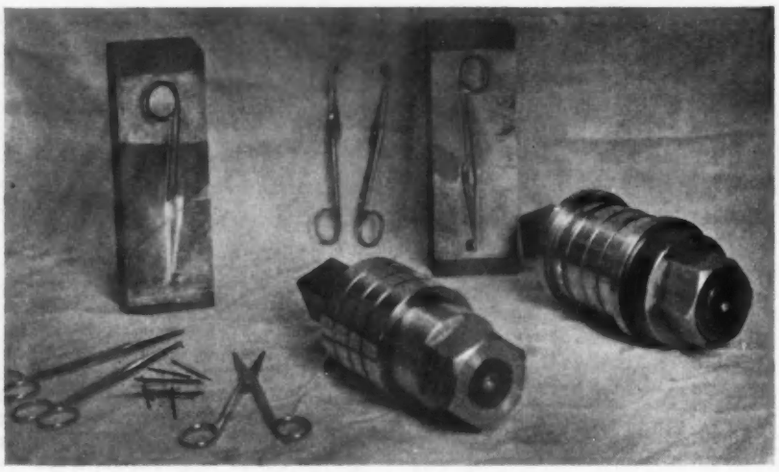


Fig. 4. This shows a set of rolls used in forming the cutting edge. Machine work on these is to an accuracy of 0.0001 in. and the cost of each roll is said to be approximately $1,000. In the background are shown a set of dies used in forming the stainless steel shanks, and in the left foreground are several finished scissors with a group of renewable edges

pot is mounted in a heat insulating chamber and because the steel walls never get any hotter than the bath, it has an especially long life. The temperature control is secured by varying the secondary voltage.

The parts to be treated are hung on racks submerged in a pot containing No. 130 Lavite, held at 1825 deg. F. A bell above the furnace, which rings at minute intervals, serves as a signal for the operator to put in a new rack and take out one that has completed the cycle and is thus up to temperature. Quenching is in oil. The parts are later drawn at 800 deg. F. and then go directly to the first tank of a Bullard-Dunn descaling process.

It is important after heat treatment to have all traces of scale removed and at the same time to have dimensions unaltered. Nearly all types of pickling were tried and discarded. Sand blasting was out of the question due to the minute dimensions. Lapping of such a small undercut groove also was discarded as being impractical. Finally the Bullard-Dunn process was tried and is proving highly satisfactory. In fact, the manufacturers have said that without this particular process or one of similar nature, it would be impossible to produce the scissors in their present design.

Descaling Proves Successful

The Bullard-Dunn process has been described at considerable length in previous issues of THE IRON AGE. It is essentially an electro-chemical method of removing scale, oxide, grease and dirt from metal surfaces. Its action comes through the generating of hydrogen on the surface of metal beneath the scale or oxide. At the Bard-Parker plant the tank used has a series of lead anodes on either side and one feature of the process is the depositing of a very thin film of lead on all surfaces of the shanks as the scale is removed.

FIG. 5. Two of the descaling tanks used in the Bullard-Dunn process are shown here. The lead anodes hang on conductor rods at each side

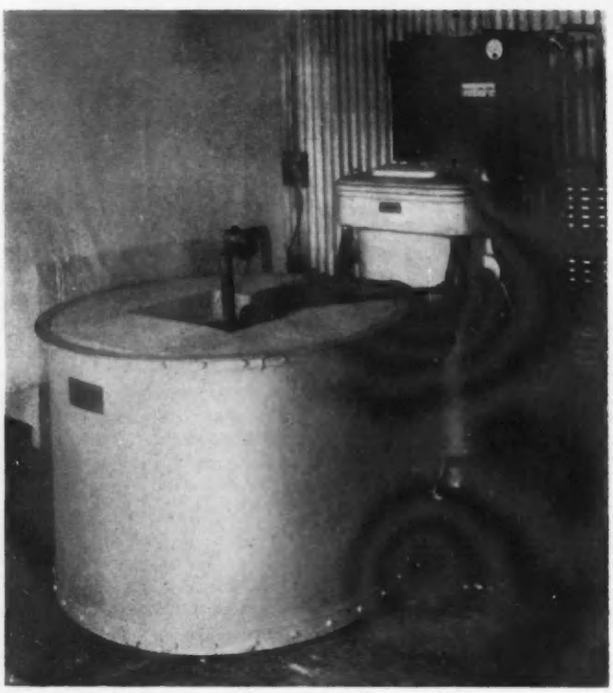


FIG 6. This shows the liquid bath furnace used for heat-treating the stainless steel shanks

The experience of the manufacturer in this particular case is that the original metal surface suffers no reduction or dimensional change whatever. In the foreground of Fig. 5 is shown the acid tank. The shanks, which hang on hooks in the center of this tank, form the cathodes. The second tank is an alkaline tank with a solution containing 3 oz. of soda ash, 4 oz. of tri-sodium phosphate, 9 oz. of caustic soda, to 1 gal. of water. The thin lead coating which is deposited in the first tank is removed in the alkaline tank by reversing the current. From the alkaline tank the parts are transferred first to a hot water tank and then a cold water tank for rinsing.

Subsequent drying completes the operation and the parts then are in condition to take a high finish. The

polishing is rather elaborate, consisting of a series of grinding operations using fine-grained wheels, followed by cloth wheels using emery flour. Careful inspection precedes the final packing.

Into the extremely small rail groove cut in each shank must slide the specially shaped steel cutting edge. This edge is made of high-grade carbon steel with carbon held from 0.80-0.90 per cent. It has the rather complicated cross-section shown in Fig. 1, and all dimensions must be accurate to provide for easy placing and removing of the edge in service. It is difficult to appreciate the delicate processes which enter into the production of this renewable edge, but some idea may be had from the fact that it is rolled into its final form from a round wire about the size of the wire used for an ordinary paper clip. Twelve cold passes are required to transform the round wire into its final form which, as may be noted, has a cross-section with a longest dimension of about 1/16 in. The rolling is done on a special rugged type of roll mill in which the work rolls are supported without bearings against heavy backing rolls. This mill in operation is shown in Fig. 3. Machine work accurate to 0.0001 in., which is comparable to that of the finest watch maker's art, goes into the construction of these small work rolls, some of which are shown in Fig. 4. The cost of each complete roll, according to the manufacturer is about $1,000. During the rolling, the wire passes from a reel at one side, through the roll stand, and is then coiled on an opposite reel. The coils are annealed frequently to prevent undue hardening from cold working.

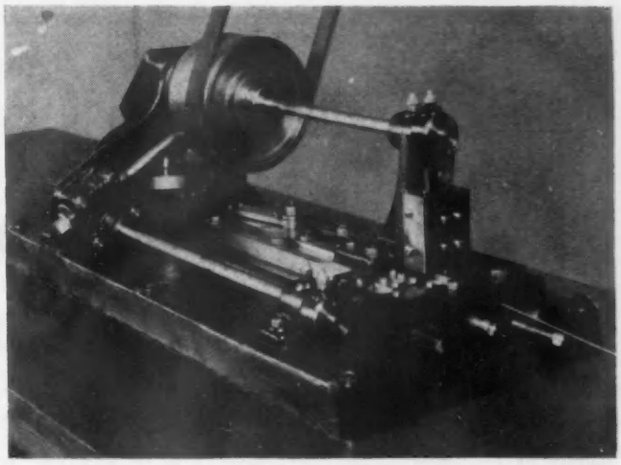


FIG. 7. A special automatic notching machine was developed to notch the finished cutting edge wire before heat treatment. After heat treatment the individual edges are broken apart in another small machine

The wire, after leaving the rolling mill, is wound up in coils which are transferred to the little special automatic machine shown in Fig. 7, where it is notched to length. This machine also cuts a locking notch which fits over a similar notch on the shank to hold the edge in place.

Following the notching, the wire passes through a continuous heat-treating sequence, with the temperature in the first oven at 1550 deg. F.

As the wire comes out of this furnace it passes through a water-cooled steel quenching block which holds it snugly between forms to prevent warping during the quenching. After quenching, the wire enters the draw section of the furnace which is held at 450 deg. F. The atmosphere in both furnaces is kept neutral by the use of a small jet of nitrogen and hydrogen which enters at the front of the furnace. Both are electric furnaces and the temperatures are pyrometer controlled. It has been found necessary to have them slightly higher than temperatures indicated in a non-continuous process.

Water Storage Tank Is Arc Welded

By B. FERGUSON
Chief Engineer, Harnischfeger Corpn.

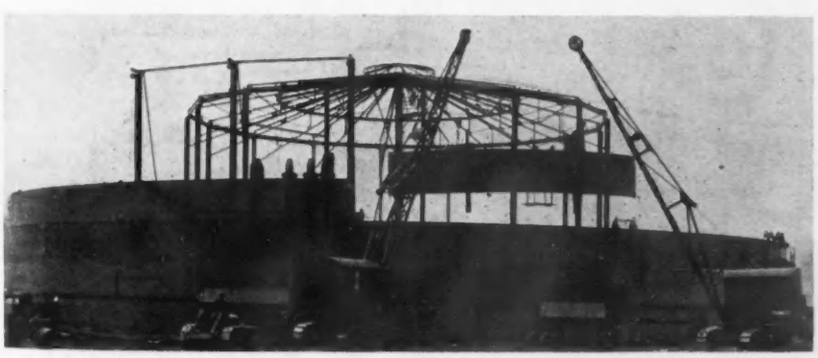
Electric arc welding was used throughout in the construction of a 6,000,000-gal. water storage tank recently completed by the city of Milwaukee. This tank is the first step in the development of a Menominee Valley booster station project undertaken by Milwaukee, to supply sufficient water pressure for peak load conditions in the western and southwestern areas of the city and suburbs. A pumping station, soon to be constructed, will complete the project.

The A. O. Smith Corpn., Milwaukee, received the contract for the erection and welding of the tank. Ten gasoline-powered P&H "Hansen" arc welders were used. Actual work on the tank began the latter part of September by laying a circular bed of cement, 165 ft. in diameter, as the foundation for the tank. A coating of asphalt was then laid upon this concrete to form a bed for the ⅜-in. steel bottom plates.

Next the side walls were erected. The first row consisted of plates 1 3/16 in. thick weighing 4 tons each welded to the floor plates inside and out. These plates were all placed in position by means of three Harnischfeger crawler cranes.

Each succeeding row of plates was slightly thinner than the previous one, in order to allow sufficient space for a satisfactory welding bead on both sides. The top plates were approximately ½ in. thick and weighed 1 ton each. The entire shell is self-supporting. The roof of the tank consists of welded sheet steel, supported on structural steel work erected in the center of the tank. Three sheets of roofing were welded together on the ground, and placed in position by means of a crawler crane equipped with an 80-ft. boom. The sheets, after being placed in position, were then welded to the structural framework. The height of the entire structure is 57 ft. 3 in. from the ground to the top of the cupola, and over 700 tons of steel was used.

On a project of this nature, steel erection is an important factor. Special grapples were used to move the steel plates and clamped over the entire width of plates during welding.



Special grapples were used to hold plates in position for welding. Three crawler cranes were employed to erect this water tank.

Variations in Coke Ash Found to Affect Analysis of Pig Iron

THE effect of variations in the ash content of coke on the analysis of pig iron was studied over a period of nearly six months in 1932 by H. W. Johnson, superintendent of blast furnaces, Inland Steel Co. The results of his observations were presented at the annual meeting in New York of the American Institute of Mining and Metallurgical Engineers. The data point to a direct relationship between variations in the coke ash and variations in the amounts of silicon and sulphur present in the iron.

The records of operations were made for furnaces Nos. 2 and 4 of the Indiana Harbor plant. The one has a 19-ft. hearth, 88 ft. 3 in. from tapping hole to deck ring; the other has a 20-ft. hearth, with a 94-ft. height from tapping hole to deck ring. The No. 4 stack is equipped with a coke-screening arrangement in the stock house, while No. 2 has none—a fact which is accepted as explaining a coke consumption with the No. 4 furnace some 7 per cent under that of No. 2, (No. 2 averaging 270 tons of iron a day with a coke rate of 1622 lb. and No. 4, 510 tons a day with a coke rate of 1505 lb.)

The procedure to ascertain the correlation of coke ash and iron analysis was as follows: If the coke ash for the 12-8 o'clock turn of one day was 5.00 per cent and for the 8-4 o'clock turn it was 4.50 per cent, there was a difference of 0.50 per cent, or 50 points. Then if the ash on the 4-12 o'clock turn was 4.30 per cent, there was a difference of 0.20 per cent, or 20 points. This difference in ash for each of the succeeding turns was determined for the entire period of five and one-half months. The variations in silicon and sulphur were noted in the same manner. The records were examined for the periods of high and low variation and the data plotted, as shown on the chart.

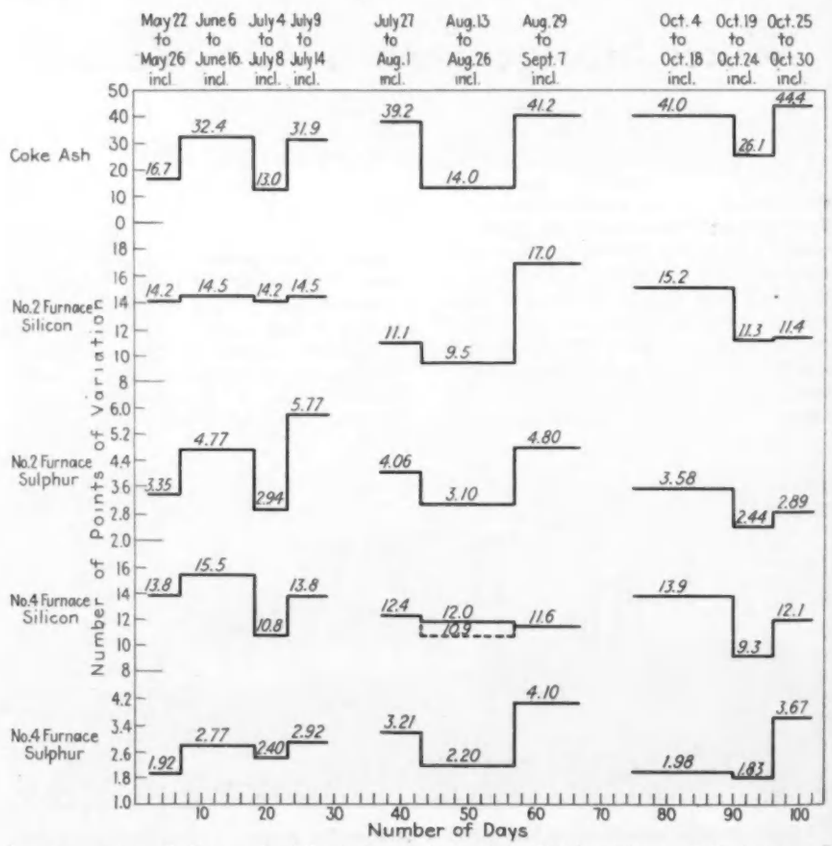
The line showing the low period in August on No. 4 furnace represents an average variation in silicon between successive casts of 12 points. In the latter part of this period there was one day when the furnace was obviously overburdened, with a corresponding drop in silicon. A decrease in burden and a too generous increase in blast temperature caused the silicon to increase very rapidly. This excessive variation was owing to the operators and not the coke ash. If this day is excluded, the average silicon variation is 10.9 points, as shown by the dotted line.

"It is noticeable," says Mr. Johnson, "that during the low period in October the coke ash variation of 26.1 points is much higher than in other low periods, although the variations in silicon and sulphur are not. This was due to the fact that the furnace was more basic at that time. It was found desirable in the latter part of September to furnish the open-hearth department with iron lower in sulphur than before. The increase in lime had a similar effect on the silicon variations.

"The most conclusive comparisons are those that occurred in adjacent periods, as in the last three indicated. It was during these periods that the excessive swings in the iron analysis were noted and this study made. In comparing adjacent short periods many variables are eliminated that would be introduced if long periods were compared. For instance, it would be unfair to compare the month of October with the month of August, because the furnaces were more basic during the latter month and this increased basicity might have more effect on silicon and sulphur variations than would any difference in variation of coke ash.

"There is a possibility that the physical characteristics of the coke used during the period may have had some influence on the furnaces and consequently on the iron analysis. It is known that the agglutinating properties of coal often differ greatly in a restricted area of the same coal seam, sometimes even in the same mine. However, it is probable that in this case this influence can be disregarded because of the nature of the coals used. The low volatile coal came from two mines which had been selected from a dozen mines in the same area after extensive sampling and testing. The high volatile coal came from our own mine which has been thoroughly sampled and analyzed without finding evidence of any marked difference in coking qualities in any part of the mine.

"Furthermore, during this period, there were no changes in coking time



Average variation of silicon and sulphur in iron during periods of high and low variation in coke ash

Variations of Ash in Coke and Simultaneous Variations of Silicon and Sulphur in Pig Iron

Period of 1932	Type	Coke Ash Average Per Cent	Coke Ash Variation, Points	No. 2 Furnace Average Sil.	No. 2 Furnace Average Sul.	No. 2 Furnace Variation Sil.	No. 2 Furnace Variation Sul.	No. 4 Furnace Average Sil.	No. 4 Furnace Average Sul.	No. 4 Furnace Variation Sil.	No. 4 Furnace Variation Sul.
May 22-26	Low	4.19	16.7	1.13	0.029	14.2	3.35	1.09	0.026	13.8	1.92
June 6-16	High	4.21	32.4	1.09	0.032	14.5	4.77	1.09	0.027	15.5	2.77
July 4-8	Low	3.98	13.0	1.19	0.029	14.2	2.94	1.07	0.027	10.8	2.40
July 27-Aug. 1	High	4.16	39.2	1.08	0.028	11.1	4.06	1.15	0.030	12.4	3.21
Aug. 13-26	Low	3.94	14.0	1.21	0.028	9.5	3.10	1.13	0.027	12.0 (10.9)	2.20
Aug. 29-Sept. 7	High	4.68	41.2	1.11	0.032	17.0	4.80	1.13	0.031	11.6	4.10
Oct. 4-18	High	5.10	41.0	1.15	0.027	15.2	3.58	1.10	0.026	13.9	1.98
Oct. 19-24	Low	4.89	26.1	1.15	0.024	11.3	2.44	1.10	0.027	9.3	1.83
Oct. 25-30	High	5.28	44.4	1.13	0.027	11.4	2.89	1.05	0.029	12.1	3.67

and only very slight changes in the percentages of low and high volatile coals used in the mixture to the ovens.

"Therefore we feel that neither the variations in the coking quality of the coal itself, the mixtures of coal used or the process of manufacture had any marked influence on the furnace. We believe that there is a correlation between the variations in percentage of ash and variations in iron analysis. These variations are owing to the effect which change in percentage of coke ash has on the slag in the furnace and likewise to the effect which change in the amount of fixed carbon in the coke has on the temperature of the hearth."

Permanent Molds in Production of Crankshafts

AFTER several years of experimental work the manufacture of cast iron crankshafts in permanent molds has been placed on a production basis and further extension of the permanent mold principle into the field of gray iron and alloy steel castings seems imminent. One of the recent production machines for making gray iron castings in permanent molds is shown in the illustration. This machine was designed and developed by A. W. Morris, consulting metallurgical engineer, Springfield, Mass. Mr. Morris is working in a consulting capacity with the Moore Drop Forging Co., the Ludlum Steel Co., the Ford Motor Co., the Union Carbide & Carbon Co., and others, on problems relating to die casting or permanent-mold casting of hard metals.

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THIS is the first description of the permanent mold casting of gray iron by methods developed by A. W. Morris. Further details of the process, including the technique of die-casting alloy steels, will be disclosed in an early issue of The Iron Age.

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In experimental work carried on with some of these companies he has already successfully cast camshafts, crankshafts, flywheels and other similar parts. The machine here shown is set up for production of valve stems and has been in automatic production of this particular casting for several weeks. The rate of production ranges from four to five castings a minute, and the operation, including the setting of the cores, is completely automatic.

In principle the machine acts much like a modern die casting machine, with modifications to permit the use of higher temperatures and higher pressures in the casting. One important feature is the jolt or shock

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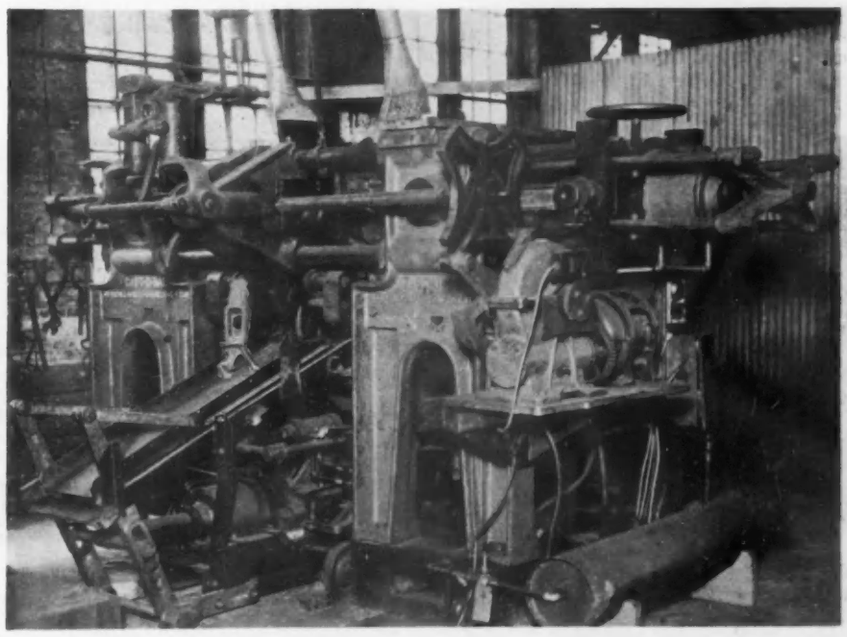
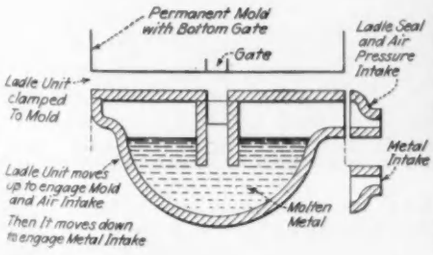
THE machine at the right is an automatic permanent mold casting machine now in production on electric gray iron valve stem castings. The sketch below is a section through the ladle from which molds are bottom-fed by air pressure.





application of pressure just as the molten metal starts to enter the mold. After clamping the ladle into position beneath the mold, the ladle intake is sealed and air pressure is admitted above the metal bath, forcing the molten iron up through a center spout which is tightly clamped to the bottom gate of the mold. This center spout is large enough to prevent any appreciable cooling during the slow ascent of the metal. When the metal has reached the gate, the air pressure is suddenly jumped up to a very much higher point which gives a shock impulse, forcing the metal rapidly into all crevices of the mold. This is accomplished so quickly that there is no time for freezing. The mold is provided with a special type of vents which lets the air out as the molten metal rushes in but which because of its design causes the metal to freeze, thus preventing its escape.

The metal used is electrically melted and even the melting process is automatically controlled by the level of the metal in the feeding ladle. After casting, the ladle is held in position just long enough to permit freezing at the spout. Connection with the mold is then broken and the ladle carriage is dropped. In this way an easy separation is accomplished between the molten metal in the feeding spout and the solidified metal in the gate. The mold is quickly opened and the freshly solidified hot casting is gently ejected into a jig arm, which carries it to a succeeding heat treating operation. It is possible in this way to catch the casting at close to 2000 deg. F., which is sufficient for the initial step in the heat treating sequence without application of further heat. The mold itself is made of a special alloy cast iron and has a life of from 20,000 to 25,000 castings.

Machines of somewhat similar design are now being successfully used in casting various alloy steels and in the production of clad metals using a cast iron or other soft core and casting around this core a thin layer of high-strength alloy steel.

Modernize Butt-Weld Tube Mill

By GEORGE T. CHURCH
General Superintendent,
Fretz-Moon Tube Co., Butler, Pa.

COMPLETE modernization of facilities for the manufacture of butt-welded steel tubing, ranging in size from ⅛ in. to 2½ in., has been accomplished by the Fretz-Moon Tube Co., Butler, Pa., by the erection of a modern daylight addition 70 ft. x 300 ft. to house a new cooling table, inclosed storage space and an inclosed railroad siding.

The new addition, which was built by the Rust Engineering Co., Pittsburgh, and completed on March 1, was designed to eliminate obsolete handling methods, but has served to improve the efficiency of the plant generally, as well as to add to the safety of the workers. Prior to the installation of the new equipment, production was retarded to some extent because the final cooling unit was too short, thereby delivering tubing to the "buck" hot. Thus it was necessary for each "buck" of tubing to be set aside to cool before being delivered by overhead crane to the finishing department, where straightening, testing, threading, inspection and bundling operations were performed. Further difficulties were encountered because of lack of inclosed storage area, and an unprotected car loading siding.

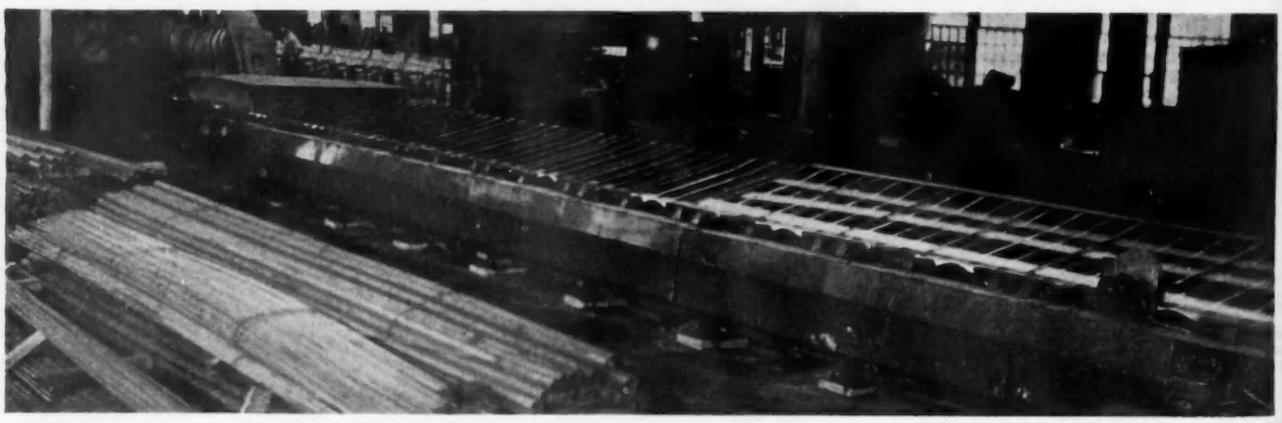
Quality Improved by Cooling Table

Automatic improvement in the quality of the finished tubing has been achieved by the installation of the new cooling table, supplied by the Mathews Conveyer Co., Ellwood City, Pa., which delivers tubing to the "bucks" cool enough to be sent on direct to the finishing department, thus eliminating the warping usually encountered when tubing is piled hot. Considerable time is also saved in the operation.

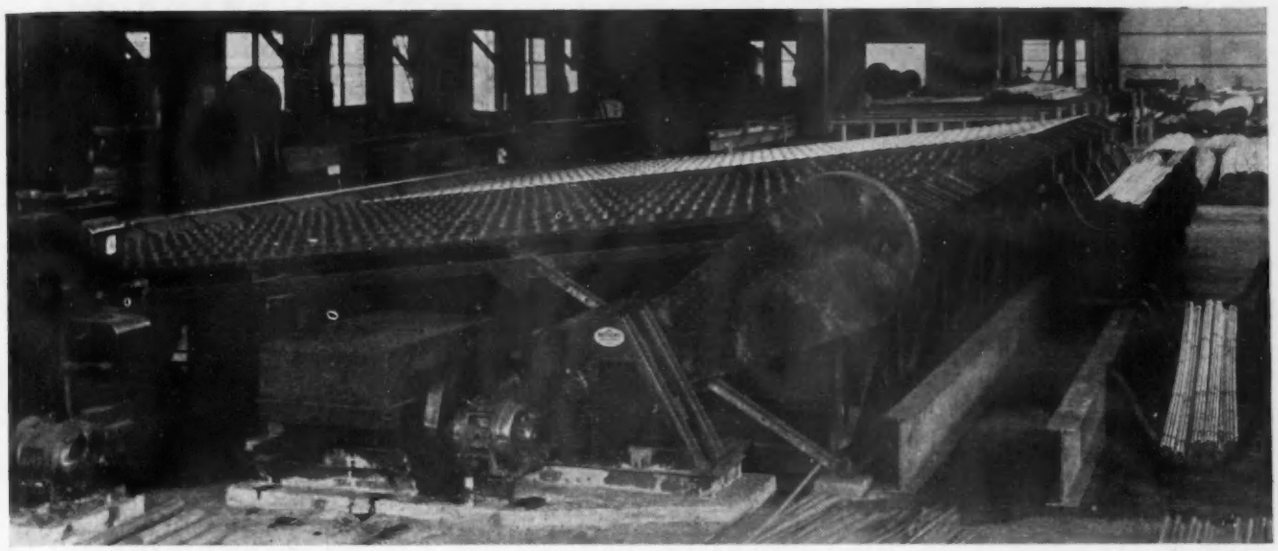
The six-car inclosed siding, which is served by a 5-ton Shaw double-hook crane, also speeds up loading operations. Increased stock storage area and additional floor space for the finishing department are benefits of a more general nature.

Continuous Process Utilized

The Fretz-Moon company utilizes the continuous process in the making of butt-welded pipe. Coils of skelp or strip steel are delivered to the reel end of the furnace, where two operators place the coil on a reel and weld the end to the preceding coil, thereby forming a continuous delivery through the furnace. As the skelp proceeds it is carried above the furnace bottom so that no foreign matter gets on either the inside or the outside of the tube. Emerging from the furnace the strip passes through a series of rolls for forming and welding it into the shape of the tube. It is then carried on "V" type wheels, which form a run-out table, at a speed to conform



Close-up of the run-out table leading from the mill. An electrical flag-type limit switch is mounted on top of the run-out table, each length of tubing striking the flag and causing the kick-off fingers to discharge the tubing to the cooling conveyor, which discharges it to another conveyor leading to the sizer.



The larger cooling table is in the foreground and the finishing department in the rear, at the right. A "buck" of tubing is piled on the skid table, where each length is inspected and started to the finishing department, through a descaler, for cold water test. By means of Lewellen variable speed transmissions the speeds of the tables are synchronized to the speed of the run-out tables, thereby permitting maximum cooling time.

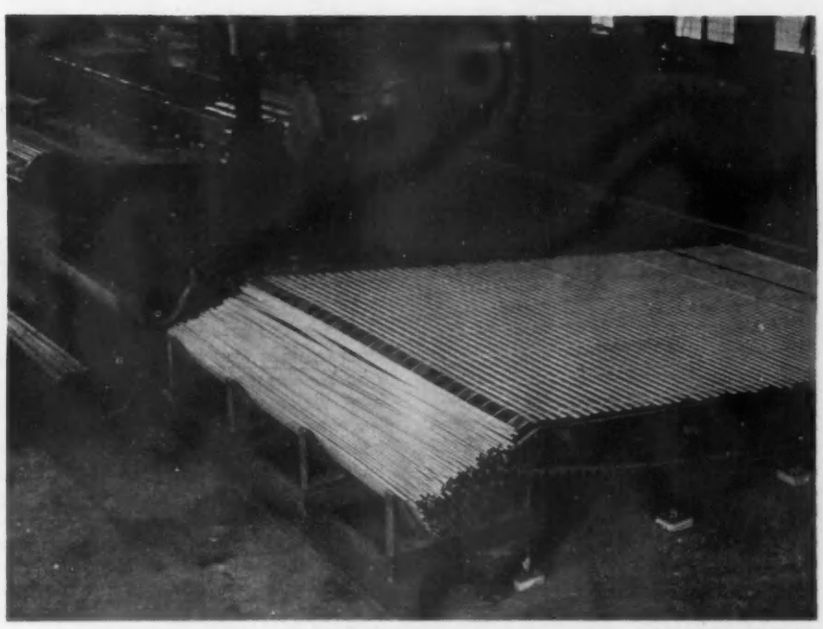
to the welding and forming rolls, and goes to a flying shear, where it is cut to length. The run-out table beyond the shear is a Mathews unit, the wheels which convey the tubing having a special contour. One half of the face of the wheels is almost vertical, while the other half is approximately 8 deg. above the horizontal. In between these are both pivoted and stationary guides having a contour similar to the face of the driven wheels.

As the tube travels over the run-out table and reaches a predetermined limit it engages a flag switch which operates a solenoid. To this solenoid, through a series of levers, is attached a pull rod supported by rollers, attached to which are fingers, whose function it is to move the pivoted arms that deflect the tubing from the run-out table to a cooling table. The pivoted arms used for deflecting have their axes perpendicular to the 8-deg. surface of the guide and have a pivoted yoke at the lower end of the axle which can be swung out of the way when necessary. This feature permits cutting tubes in very short lengths without interference of the deflecting arms, which would otherwise swing across the path of approaching tubes. The deflecting arms therefore remove tubes from the guides with the least possible damage, as practically no lifting of the hot tube is required and hence no bending occurs.

From cooling table No. 1 the tubing is delivered to another live wheel conveyor, which conveys the tubing to the sizing rolls. After passing through these rolls the tube continues its travel on a run-out table similar in construction to table No. 1 and, after engaging another flag switch, is deflected to cooling table No. 2, on which the tubing is cooled and discharged into a "buck," from which it is removed to a skid table in the finishing department. The tubing shown in the photograph is approximately 20 ft. long. Lengths up to 50 ft. can be cut and deflected satisfactorily on this mill and the auxiliary equipment already described. A feature of this continuous mill is that production can be started in an hour after the furnace is ignited, minimum time losses being secured all along the line of production.

NEW material-handling and cooling facilities, recently installed in an addition to the plant of the Fretz-Moon Tube Co., have improved operating efficiency and added to the safety of the workmen. The heating, welding and galvanizing equipment of this plant was described in The Iron Age of April 21, 1932.

In the finishing department a skilled inspector examines each length of tubing; another operator repeats this inspection and starts the tubing on its way through a straightener, from which it travels to the test stands where each length is tested under 700 lb. per in. cold water pressure. Beyond this the tubing is passed for threading. After pipe couplings are applied and thread protectors fitted on the male end, the pipe is bundled and made ready for storage or shipment.



The Mathews run-out and cooling tables viewed from crane height. A "buck" of ¾-in. tubing in foreground is nearly ready to be removed to finishing department.

Putting the Question Mark to Work

— 116 —

Buckling In Galvanizing

Is there any way to avoid buckling of tanks under the action of hot galvanizing? The tanks are approximately 3 ft. x 2 ft. x 2 ft. made of No. 12 sheets and it is necessary to fabricate them before galvanizing.

I. L. A.

IF this tank were round, it probably would not buckle, but difficulty with buckling of a square tank is almost sure to occur through the hot galvanizing operation. My opinion on this point is substantiated by Joseph P. Cattie, a well-known authority on galvanizing. As an alternative, I suggest substituting for galvanizing our process of cadmium plating known as Udyliting, or else our process of rust-proofing known as Parkerizing. Both of these processes would solve the problem of warping. We would recommend a coat of paint in each case. The cadmium would not be feasible on the inside if the tanks were closed.

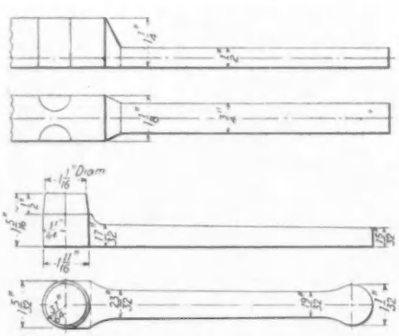
Philadelphia Rust-Proof Co.

— 117 —

Improved Forging Practice

Our present method of forging the cycle crank shown in the sketch seems slow and we would like to know a better method. We forge down 1¼-in. by 1½-in. stock to approximately ¾ in. by ½ in., after which the stock is necked as shown. The piece is then placed in stamping dies under a drop hammer and finish-formed.

F. Allen,
Stourton, England.



IT would be our practice to forge the piece out of square stock, trip-hammering the shank out to an area large enough to fill the 19/32 x 15/32 cross-section, leaving a lump at the end. We would then put the stock in this condition into the edger of the drop forging dies and from there into the first and then the second impression of the dies. We would trim the piece either hot or cold, depending upon the analysis of the steel.

Moore Drop Forging Co.

Salt Water Alloys

WHAT castings are best for submerged use in salt water? What is the best way to protect metal parts in marine construction? What is the best material for tubing to carry brine in refrigerator work? These are typical of questions recently received concerning alloys for salt water use. They will be answered on this page in early issues. Questions concerning the quality and use of metals in many other fields are constantly being received and answered in this department. If you want to know how others may have solved your problem, write about it to Forum Editor, The Iron Age Publishing Co., 239 W. 39th St., New York City.

— 118 —

Electric Furnaces For Cast Iron

I am interested in the possibility of using an electric furnace for cast iron. Can you give me some information?

P. R. A.

IN general we might say that there is no metallurgical move now making more progress than that of producing gray iron in the electric furnace. We have found in our experience that the quality of the iron is improved sufficiently by the electric furnace to make it equal to that of alloyed gray iron, without the expense of the alloys. Alloys of course may be added in the electric furnace with still further improvement. We understand that some foundries are making alloyed gray irons in this way, capable of heat treatment much the same as steel and developing tensile strength as high as 90,000 lb. per sq. in.

Pittsburgh Lectromelt Furnace Corpn.

— 119 —

Use of Tungsten Carbide

Is the use of tungsten carbide cutting tools practical for the small machine shop? **W. B.**

WE feel it is entirely practical for the small plant to use tungsten carbide tips and we believe it is feasible for such a plant to manufacture its own tipped tools, for which we would be glad to furnish the Carboloy blanks. We furnish complete brazing instructions with these blanks. The usual procedure is for the machine shop manager to forward us blueprints of the tools for which he desires substitution, together with the nature of his work. We then prepare specific recommendations and quote prices.

Carboloy Co., Inc.

— 120 —

Drawing 1½-In. Bars

Can you give us some idea for equipment needed for cold-drawing steel bars up to 1½ in. in diameter?

B. B. M.

THE usual method of cold-drawing bars up to 1½ in. in diameter is as follows: The hot-rolled or black bars are pointed in a rotary pointing machine so that the end of the bar will enter the die. The bars are then pickled to remove scale, rust and foreign material. After this they are rinsed in a tub similar to the pickling tub and then immersed in a lime bath. The liming prevents the gathering of moisture and is of assistance in holding the lubricant during the drawing operation. The actual drawing is done on a horizontal chain-type bench and, depending upon the size of the bench, one or more bars may be drawn simultaneously. In a small plant with moderate tonnage a bench with maximum capacity of one 1½-in. bar will probably be sufficient. After drawing, the ends of the bar are sheared or cut to multiple lengths and subsequently straightened. Rotary-type straighteners are used for round bars and multiple roll type straighteners are used for squares, hexagons and flats. For a small plant a one-way straightener would be satisfactory. In this the bar is straightened first in one direction and then given a second pass with the bar turned at 90 deg. and straightened in the opposite direction. Other equipment might include cutting-to-length shear units with gage tables and other like equipment. We are in a position to build all of the equipment and to furnish engineering advice and other assistance.

Aetna-Standard Engineering Co.

— 121 —

Heat Conductor Tubes

Can you tell us what material to use for a ¾-in. tubing with 16-gage walls that will have adequate strength and at the same time be an efficient conductor of heat? It must be easily welded and machined and must resist corrosion.

Moore Dry Kiln Co.

THE requirement that this tubing must resist corrosion makes the answer difficult. It looks as if the material were desired for a heat exchanger tube and we know that even good stainless steel has failed in some heat exchanger applications. We feel sure there is an alloy which will solve this problem, but we would like to know more about the corrosive medium and temperature conditions before recommending.

Timken Steel & Tube Co.

Hydraulic Transmission Operates Without Tank or Relief Valves

HIGH operating efficiency without undue heating is claimed for the high-pressure radial pump unit illustrated, which has been announced by the B. A. Wesche Electric Co., Cincinnati. A feature of this design is that neither oil storage tank nor relief valves are required; in this connection it is stated that the mechanical analogy most applicable is that an annular column of oil is used as a rack and the pump functions as a pinion, meshing with the rack in variable ratios. Applications of this Wesche hydraulic generator include cranes and hoists, machine tools, testing machines and mechanical stokers.

Wesche hydraulic generator applied to hoist. It is entirely self-contained and can be operated in any position.

The unit shown is direct-coupled to a ¼-hp. constant-speed motor. Control of delivery volume is at point *A*. This volume control can be operated either by screw pressure, by cam or by plunger movement, according to the requirements of the machine to which the unit is applied.

No valves are required to operate the work piston. When it is desired to reverse the direction of this piston, movement of oil column is reversed either by reversing the driving motor or changing the position of the pendulum that carries the piston and cylinder assembly.

The pump rotor carries five pistons and is mounted as a pendulum. Reactance to the generated oil pressure is taken on a spring mounted in a cartridge, one end of which is in contact with a piston under oil pressure. In this way the rotor is held in equilibrium until displaced by the screw, plunger or cam adjustment made at point *A*. By changing the spring, the pump can be made to operate at any pressure up to 5000 lb. per sq. in. Normal working pressure is 1500 lb. per sq. in.

Other features include automatic protection against overload and shocks. Two types of overload protection are offered, mechanical and hydraulic. The latter automatically regulates generator displacement of the pump, the cycle of operation being continued when overload is removed.

There are only seven moving parts in the unit, and anti-friction bearings are used wherever advantageous. The generator can be operated in any position. Temperature rise is said to be practically negligible during continuous operation under full load. Patents have been applied for.

Compact Dry-Type Portable Draft Gage

A PORTABLE draft gage with standard range either of ½-in. or 1-in. water has been placed on the market by the Hays Corpn., Michigan City, Ind. The gage is of dry type, no liquids being used. Overall dimensions are 4 x 5 x 9 in., and the weight, 4¾ lb. The case is made of cast aluminum finished in black lacquer and has a glass window and slip-over metal cover. Sturdiness as well as compactness is claimed for the construction.

Scale length is 3 in., and gradations are in 1/100 in. water.

As leveling is not required, the gage may be set up on any convenient surface, and this, with quick setting of the pointer to zero by means of a screw on the outside of the case, permits rapid setting up. A reel is furnished for carrying rubber tubing without kinking, and clips are provided for carrying the metal tube which is inserted into the smoke pipe.

Differential type gages can also be furnished for indicating resistance, gas or air flow. For forced draft stokers two-pointer gages with an upper scale having a range of plus 5 in. and lower scale plus 0.2 in. to minus 0.3 in. water are offered. Other ranges for special applications are also obtainable.

Portable Grinders Built to Suit Various Needs

A NEW portable surface grinder and disk sander, made in several models for various uses, each with a fixed speed best suited for the work, has been placed on the market by the Rotor Air Tool Co., Cleveland. Light weight, power, and good balance are features of these tools. An automatic quick-acting governor is provided to prevent racing of the motor and to keep the speed within safe limits.

For grinding, the 5500-r.p.m. model is recommended. On flat surfaces this tool, with a 6 x 1½-in. straight-side cup wheel, will produce a smooth, even surface. On welds the 6¼ x 2-in. flaring cup wheel is used to enable the operator to watch closely the removal of excess metal while grinding the weld down to a level with the adjoining metal. An unusually large combination radial and thrust bearing is employed to carry the load of the wheel at these high speeds.

A 3600-r.p.m. model with a cup-shaped wire brush is available for removing rust and scale from pipe, structural steel and other material. When a fine finish is desired on metal surfaces, it can be obtained rapidly with the 4700-r.p.m. model equipped with a 9-in. flexible sanding pad and abrasive disks.

This surface grinder and sander can be furnished with speeds best suited to the work.

Yoke Riveters Feature Light Weight

ALUMINUM alloy castings are used extensively in the new yoke-type compression riveter placed on the market by the Hanna Engineering Works, 1765 Elston Avenue, Chicago. Alloy steel forgings, hardened and ground, and heat-treated alloy steel castings are employed for other major parts of the new machine, which with its light weight, 170 lb., and compactness, is particularly adapted for portable use.

The riveter develops 15 tons between the dies, which tonnage is sufficient for heading 5/16-in. diameter cold rivets. The mechanism is entirely

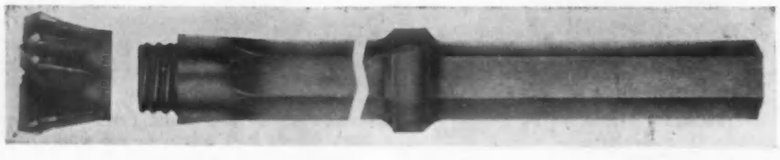
inclosed and operates in a bath of oil. The yoke may be swiveled 360 deg. upon the die axis, and may be removable quickly for interchange with yokes of other shape, reach and gap. The yoke shown has a reach of 3 in. and a gap of 3 in.

When suspended from a balancer, which provides free vertical movement and which, in turn, is suspended from a crane that provides free horizontal movement, the machine may be easily and quickly moved from rivet to rivet. Such an installation is particularly suitable for assembly riveting automobile chassis frames of the new X-cross member design.

Timken Introduces New Removable Drilling Bit

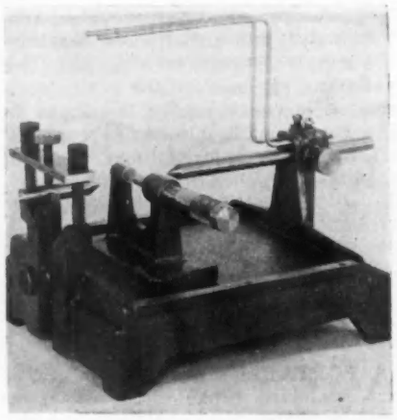
LONGER drilling life, as well as savings in drill steel and resharpening equipment, are claimed for the new removable-type drilling bit introduced by the Timken Roller Bearing Co., Canton, Ohio, after three years' development work.

This bit, which replaces the conventional bit forged on the end of the hollow drill steel, is held tightly against an upset shoulder on the steel by means of a special thread designed for strength and easy removability. This left-hand thread is opposed to the direction of rotation of the steel so that the bit is kept tightly against the shoulder while drilling. The hammer blow is transmitted from the steel through the shoulder to the body of the bit. None of its force is absorbed by the thread. When a Timken bit becomes too dull for further service it may be quickly removed and replaced with a new one—a matter of seconds.



Three-Wire Thread Measuring Fixture

THE three-wire thread measuring fixture recently brought out by the Brown & Sharpe Mfg. Co., Providence, R. I., is designed for measuring screws and other externally threaded parts where commercial tolerances may be allowed. It is particularly useful for checking short and long taps with even numbers of flutes, and provides a convenient means of



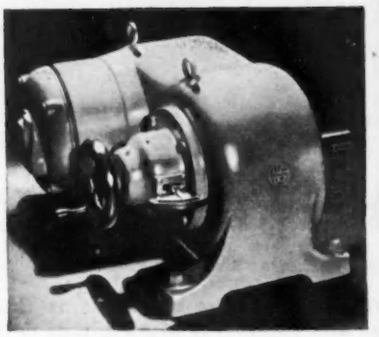
checking external thread gages where the highest degree of accuracy is not demanded. The fixture, designated as the No. 200, has a range of measurement for 0 to 2 in., and is furnished with two micrometers, one reading from 0 to 1 in. and the other from 1 to 2 in. A standard setting for the latter is included.

Threaded parts to be measured are held between the pointed shaft and the V-slide, which is adjustable to accommodate parts ranging from 3/16 to 1¾ in. in diameter. An auxiliary short shaft can be used in the V-support; this shaft has a point on one end and a bell-mouth on the other. The micrometers float on steel balls, thus permitting the anvil to be "square" with the measuring wires. They are graduated in one-half thousandths, so that one-quarter thousandths can be estimated readily. The patented adjustable thimble gives means of compensation for wear. Ample bearing surface against two of the measuring wires is provided by the ⅜ in. diameter anvil. The micrometer spindle, which bears against one wire, is ¼ in. in diameter. Calibrated wires can be furnished in the "best wire sizes" for the required pitches. The wires are suspended from the adjustable support and each wire has a metal tag on which the decimal size is plainly marked.

Variable-Speed Unit Provides Close Control

A VARIABLE-SPEED unit known as the Varidrive motor, by means of which a wide range of speeds is instantly obtainable in increments as fine as 1 r.p.m., while the driven machine is in motion, has been announced by the U. S. Electrical Mfg. Co., Los Angeles.

The Varidrive motor consists of a simple squirrel cage motor and a variable speed differential which comprises dual disks coupled with the company's "varibelt." The differential disks, called "varidiscs," reciprocally expand and contract for the higher or lower speeds, transmitting power through the "varibelt" to the take-off shaft. The motor is arranged for local or remote control. The local control is by a handwheel mounted on the unit, and remote control is from a push-button station or a handwheel located to suit the con-



venience of the operator. Automatic remote control can also be furnished.

Movement of the handwheel through 3 deg. produces a change of 1 r.p.m. in the speed at the take-off shaft, and a full turn of the handwheel alters the speed 120 r.p.m. The remote control type has similar speed regulation. The "microspeed" indicator mounted on the case of the device furnishes visual observation of the speed of the take-off shaft. The scale of the dial segment may be removed and replaced by special scales calibrated to rate of production, if desired.

In addition to flexibility, high efficiency, stability at all loads, and quiet and smooth operation are features emphasized. Ball bearings are employed throughout.

What Kind of Inflation Impends?

By G. L. LACHER

IT is generally assumed that the United States is now definitely headed for inflation. Final suspension of all gold payments and the Thomas amendment to the farm bill giving the President extraordinary powers over our monetary machinery have been hailed as certain precursors of a sharp upswing in the prices of securities and commodities. Already the markets have responded, seemingly bearing out this reasoning.

What Is Inflation?

But rising prices are not necessarily identical with inflation. For inflation really means expanding the volume of money faster than the volume of production. Soviet Russia, which has a monetary system that is entirely isolated from those of other countries, furnishes an excellent example of inflation. It has greatly increased its volume of currency and has sharply advanced wages, but the result has merely been higher prices. In other words, the production of consumer goods has not expanded and the Russian workman's standard of living is no higher than before.

The situation is different in this country. Here we have a great surplus of goods and services that are not being used because prices have been falling. If a recovery in prices causes commodities and services to be exchanged in greater volume, the result is not necessarily inflation. It may well be what everyone desires—business convalescence.

Inflation Doesn't Always "Take"

Inflation does not always "take." It is not enough to increase the quantity of credit or currency. If the money is not used, prices will not be affected. In fact, one of the most difficult obstacles to overcome in a period of deep-seated deflation is to draw money out of idleness. Hoarding is not solely due to fear for the safety of capital. An equally strong motive is the knowledge that money will increase in buying power the longer it is kept out of use.

The gold embargo, the Thomas measure and the ban on gold hoarding in this country are all parts of a program designed to protect our economy from the degenerative influence of monetary immobilization. So long as the gold reserves of our banking system could be depleted at will according to the whim or design of domestic hoarders or foreign short-term creditors, it was impossible to set in motion an effective program to check deflationary forces.

In normal times the free flow of gold has proved a necessary stabilizer of international business. Gold movements have rectified temporary inequalities in trade balances, thereby keeping the monetary units of all gold standard countries at parity. Fixed relationships between moneys are desirable to protect international trade from the hazards of fluctuating exchanges.

Gold Raids "Stymied" Reserve Policy

But these are not normal times. Although Europe is heavily in debt to this country, it has had considerable credits here in the form of short-term loans. So long as the United States remained on the gold standard there was nothing to prevent the withdrawal of those credits in gold. And that is exactly what has been done on a broad scale on three separate occasions. In the autumn of 1931, within two months after Great Britain went off gold, this country lost $750,000,000 in gold. Heavy withdrawals were resumed in February, 1932, lasting until the middle of June. Again, this year, there was a similar raid, which in the short period extending from mid-January until early March reduced our gold reserves $232,000,000.

Whatever may be the advantages of free gold payments in ordinary times, it must be clear that they are most harmful in a severe depression. All efforts of our banking system to combat deflation through an "easy" money policy have been "stymied." In fact, the open market operations of the Federal Reserve banks, whereby Government securities have been bought from member banks to expand credit reserves, have accomplished little outside of offsetting gold withdrawals.

Open Market Policy Under New Conditions

The first provision of the Thomas measure—and the one that the Administration will depend upon before trying the others—authorizes the purchase of Government securities up to $3,000,000,000 by the Federal Reserve system. It is evident, then, that Washington pins its first hopes on credit expansion, which is far removed from currency inflation and was, in fact, the approved policy of the Hoover regime. Though it failed under Hoover, it is expected to succeed now because our gold base has been protected from depletion.

Price Prospects Uncertain

Guesses as to how much prices will rise as a result of recent developments are merely guesses. Undoubtedly most American business men, remembering previous false starts, will be cautious about taking too much for granted. It is true that the dollar has depreciated, simultaneously helping the exporter and handicapping the importer. But there is no way of telling whether depreciation is here to stay.

At the moment the dollar is affected by world-wide speculation. Yet short selling of the dollar may subside after a time and then dollar exchange may be determined by our international balance of payments. Since we are in a strong creditor position and, besides, still have a favorable trade balance, the demand for the dollar should exceed our demand for foreign currencies, thereby driving the dollar back to its old position or even to a premium. And, in addition, the demand for the dollar may be artificially sustained by the operations of foreign governments. It is common knowledge that the British exchange equalization fund has been used to keep sterling exchange down in relation to the dollar.

Time Is in Our Favor

Nevertheless, recovery of the dollar may not occur for some time, and time is in our favor. Having been freed from the deflationary influence of gold withdrawals and temporarily relieved of the full force of competition with depreciated currency countries, American business may gather sufficient momentum to forge head regardless. In other words, a flourishing trade in this country would tend to raise world prices to our level, whereas under the recent condition of virtual stagnation domestic prices have been pulled down toward the world level. One only has to recall what has happened in the iron and steel industry to see that this can actually occur. Iron and steel imports were heavier in 1929 than they are now, but our domestic business volume was so great that they were not felt. In the past year and half, on the other hand, domestic volume has been so low that prices have tended to seek the competitive levels established by cheap importations.

A natural question at this time is whether British experience throws any light on the future course of prices in this country. All that the

British were able to accomplish with reference to internal commodity prices by abandoning the gold standard was to halt the decline. It would be foolhardy to make an unqualified prediction that our own departure from gold will do more. However, the United States, as distinguished from Great Britain, is normally a much larger user of the world's materials. If our industries again revive, the demands that are set up may indeed be enough to swing the pendulum of world prices up again.

Certain it is that many of our industries are even now within calling distance of a profitable operation. In steel and in other fields there have been encouraging gains in business of late. A few more increases, and profits will again be possible. In fact, in the steel industry, where so many economies have been introduced during the depression, a 35 per cent operation would spell the end of deficits, according to leading executives.

Brewery Equipment Trade In New Organization

The National Institute of Manufacturers and Distributers, an organization comprising about 1000 manufacturers and dealers in equipment and supplies for the brewing industry, formed a New York chapter at a meeting at the Hotel New Yorker, New York, on April 20. About 200 representatives of interested companies attended the New York meeting. Benjamin Schwartz, trade relations counsel and director general of the Institute of Scrap Iron and Steel, addressed the gathering.

Robert Read, International Paper Co., was elected temporary president of the New York chapter. William M. Witton, American Cork & Insulation Co., is vice-president, and G. B. Dingley, Crown Cork & Seal Co., is secretary.

Bethlehem Makes New Type Galvanized Wire

Shipments of a new type of galvanized wire, made by a new patented electric process and marketed under the trade name "Bethanized," were started last week from the Maryland plant of Bethlehem Steel Co., Sparrows Point, Md. This wire does not supplant hot-dipped galvanized wire, but is manufactured for special purposes, such as telephone lines, where the wire is submitted to unusual bending and twisting, and where high resistance to corrosion is a factor.

One of the initial shipments was an order of 11,000 lb. for the Zoo in Washington.

The Rockdale, Tenn., furnace of the Tennessee Products Corpn. producing ferrophosphorus, has resumed operations after long idleness.

Opinions Vary as to Price Effect of Gold Suspension

WASHINGTON, April 25.—During the brief period since the United States "officially" suspended the gold standard the stock and commodity markets have performed as they did immediately after Great Britain abandoned the gold standard in September, 1931. With some fluctuations, there has been a rising price trend in the past week in the United States.

During the first few months after Great Britain departed from the gold standard commodity prices rose about six per cent. But in March, 1932, British prices began to decline, and they are now about one per cent below the level existing in September, 1931.

Economic "Conversations" Arouse Hope

The widely conflicting views of economists, financial interests, business men and members of Congress over the abandonment of the gold standard and the Administration's "credit expansion" program reflect a state of perplexity combined with the hope that something definite and reassuring will quickly grow out of the momentous moves being made in Washington. It is hoped also that something tangible and helpful will come from the "conversations" of President Roosevelt with Prime Minister Ramsay MacDonald of Great Britain and former Premier Edouard Herriot of France.

The present conference, actually only preliminary to a world conference, is conditioned by the usually widely divergent nationalistic interests, some of which are so fundamental that to many they seem hardly surmountable. However, remote as it may be, the hope is held that the conversations may bring about a move looking toward international agreement on currency, stabilization of monetary exchanges and exchanges between nations.

Congressional Opposition Develops

While prominent Republicans in Congress, together with some Democrats, are vigorously fighting the Administration program, its supporters maintain that President Roosevelt is consistent in his efforts to raise commodity prices, reengage labor and restore purchasing power both through increase in employment and in wages. Organized labor is strongly contending for a rise in wages first on the theory that the inflation will raise the cost of living.

Led by Senator Reed, Republican, of Pennsylvania, the reflation program is strongly assailed as a return to "Bryanism" and "greenbackism." Supporters of the Administration just as vigorously deny that the program, proposed through the amendment of Senator Thomas of Oklahoma to the farm bill, goes beyond "managed currency." It authorizes the President to direct a $3,000,000,000 expansion in credit. Should that device fail, he would be authorized to order the issuance of unsecured currency up to the amount of $3,000,000,000. Retirement is proposed through a 4 per cent sinking fund. He would also be authorized to devalorize the gold dollar by 50 per cent. Further provision is made that within one year the President may accept up to $100,000,000 worth of silver in payment of war debts at prices not to exceed 50c. an ounce, this silver to be used in the currency system of the United States.

It is argued by opponents of the program that increasing the money supply through expansion of credit and bank deposits did not come about when Federal Reserve bank open market operations, under the Hoover administration, accumulated about $1,000,000,000 worth of Government obligations. The present plan also, of course, calls for such operations, but on a much wider scale. The previous experience saw the rapid accumulation of reserves by member banks, some used for the discharge of rediscounts, others to supplant gold withdrawals by foreign countries, and some turned over to meet heavy domestic demands for currency made upon commercial banks.

Relation to Steel Demand

It probably is true that neither the steel nor any other industry has as yet a definite opinion of the significance of the Administration's credit expansion program. Even careful students of economics and currencies, exchange, etc., differ widely, and some are frank enough to concede they cannot take all the complexities of such a subject into calculation.

There are reports coming to Washington, however, that the Administration's program has been an important element in stimulating some forward buying of steel. This factor was almost wholly absent until there were well defined reports that the Administration was preparing to increase the money supply, raise commodity prices, and restore employment and purchasing power.

Interlake Iron Corpn. in the first quarter of 1933 came within $5,000 of covering its interest charges, before depreciation. This is the closest the company has come to meeting its interest requirements since the second quarter of 1931. The improved showing was due to economies rather than to any material upturn in business.

OFF THE ASSEMBLY LINE

Retail Automobile Sales Move Upward; Steel Releases Continue Heavy

DETROIT, April 24.

DEVELOPMENTS of the past week have further heightened the optimism which has pervaded Detroit since early in April. Retail automobile sales have shown an upward trend all of this month. Sales executives are predicting that retail deliveries in May will considerably surpass those in April; in fact, the outlook for motor car sales in the next three months is far better than the industry anticipated even a few weeks ago. President Roosevelt's reflation program has elicited favorable response in automotive circles. Observers believe that any action which will bring about higher commodity prices will be beneficial to car sales. The retail sales chart during the depression has followed closely the trend of commodity prices. The worst slump in sales has been in the usually rich mid-western and southern districts where people are dependent on incomes from agricultural products. It is thought that the restoration of higher prices for such products will be immediately felt in a greater demand for motor cars.

Steel Releases Are Heavy

Motor car production is continuing to rise, with May promising to be the peak month of the year. This upward trend brought out heavy steel releases the past week. Chevrolet placed orders for its Flint plant for the early part of May and likewise considerable of its steel requirements for next month for its local gear and axle and forge plants. Chrysler gave releases for its Plymouth and Dodge divisions, while Ford ordered steel from day to day. Steel purchases scheduled for the next two weeks are of substantial proportions. Ford is about to buy for 50,000 cars and Chevrolet around May 1 will place its steel tonnage for its Flint plant for the latter part of next month. Car manufacturers are pushing steel mills for deliveries. In several cases suppliers have been instructed to disregard shipping dates and dispatch material as rapidly as it can be made. Steel is being hauled by trucks from the Pittsburgh, Youngstown and northern Ohio steel districts to keep automobile companies and parts manufacturers from being delayed in meeting recently increased schedules.

Detroit's retail and manufacturing trades this week will feel the stimulus of the release of 30 per cent of the funds tied up in the two large defunct banks. The conservators state that the total amount to be paid out to depositors will be $131,201,000. This is believed to be the largest sum of money ever freed at one time in any American city. It will be especially helpful to many small metal-working companies which have most, if not all, of their working capital frozen in the old banks. Automobile companies are expecting a sharp gain in retail sales in metropolitan Detroit, which will be reflected in May figures.

Chevrolet Production 60,000 in April

There has been intensification rather than relaxation of Chevrolet production, which will be close to the 60,000 mark in April. It is said that May assemblies have been tentatively set at 60,000 passenger cars and 7000 trucks. The exact figure will be governed by retail sales, which are increasing at a gratifying rate. It is understood that Chevrolet's retail deliveries this month will be 50,000 to 55,000 units. All manufacturing and assembly plants are operating five days a week.

Ford is reported to be making 1700 to 2000 units a day at its Rouge plant. Of this number about 200 units are four-cylinder cars. Ford production is understood to have reached 2500 units for one or two days, but then fell back. Ford hopes to attain a steady output of 2500 cars a day five days a week during May. Some Ford suppliers are working six days a week, and Briggs and Murray are said to be running seven days a week to keep abreast of Ford's body requirements. There has been a revival of stories that a prominent steel company is soon to take over the Ford steel mills, but this report is discredited in well-informed circles.

Plymouth introduced on Saturday a new Standard six on an 108-in. wheelbase to replace its car of the same size which was put on the market last November. The car is practically identical in appearance and mechanical features with the de luxe car announced a week ago. The business coupe is priced at $445, representing a reduction of $50 from the previous figure. This is the same price as the Chevrolet standard six coupe, $5 higher than the Ford four and $45 less than the Ford V-eight. The four-door sedan is to be sold at $510. Chevrolet has no comparable model in its standard series. The Plymouth plant is continuing to work 24 hours a day, seven days a week, to stock dealers. April assemblies will be about 20,000 units with no slackening of this pace contemplated in May. The Chrysler foundry and transmission departments, located at the Dodge plant, are operating 24 hours a day to supply Plymouth and the other Chrysler units. Chrysler sales to dealers and distributers in the first quarter totaled 57,861 units, compared with 55,704 units in the same quarter of last year. Chrysler improved its position in the industry by securing more than 20 per cent of the total retail automobile business of the country, largely through the good showing made by its Plymouth and Dodge divisions. The corporation reduced its expenses 23 per cent compared with the first quarter of 1932.

Detroit Employment Increasing

Pontiac will make 7000 to 8000 cars this month and has 8000 scheduled for May. Buick has increased its operations to five days a week. Dodge still is holding to 400 cars a day five days a week. Reo is working five and a half days a week to stock dealers with its forthcoming model. Graham has considerably increased its operations this month. Hudson is operating five and a half days a week, nine hours a day, and has 2938 unfilled orders on hand.

Motor car makers are not contemplating with equanimity the possible effect on steel prices of a continuation

of the present demand for steel and of currency inflation. One important company has quietly put out feelers to see whether it can cover its estimated steel requirements for the balance of the year at current prices. In the event that it cannot do this and a considerable steel price advance should appear certain, it is thinking about buying sizable quantities of steel ahead and storing it in one of its plants, which has been in disuse for some time.

Great Lakes Steel Corpn. continues to operate all of its six open-hearth furnaces. Its bar, strip and sheet mills are running at relatively high rates. Employment in Detroit on April 15 stood at 47.5, according to the index of the local Board of Commerce. This compares with 41.8 on April 1 and 63.6 on April 15, 1932. A further gain is expected the latter part of this month.

To Discuss Economies Through Reengineering

"Reengineering for Economical Manufacture" is the major topic of an industrial conference to be held at the Case School of Applied Science, Cleveland, May 11 and 12. Ten papers will be presented at the four sessions; in addition there will be a discussion of "Planning for Profits" at a meeting held jointly with the Cleveland Engineering Society and the American Society of Mechanical Engineers at the Hotel Statler, Cleveland, on the evening of May 10.

Papers on May 11 include: "Redesign of the Product to Increase Appeal to the Purchaser," by R. E. Hellmund, chief electrical engineer, Westinghouse Electric & Mfg. Co., and "Development in Manufacturing Processes," by D. Levinger, engineer of manufacturing, Western Electric Co. The latter paper will discuss reduction of costs by using suitable materials as well as by improved production methods. At the afternoon session, H. P. Bailey, assistant to the president, Warner & Swasey Co., and president, Rotor Air Tool Co., will speak on "Selection of Equipment." There will also be an address on changes in plant layout to accommodate varying production.

"Metal Forming to Eliminate Machining" will be discussed by C. D. Harmon, National Machinery Co., at the morning session, May 12. At the same session J. K. Olsen, Stewart-Warner Corpn., will present a paper on "The Place of Stampings in the Product," and R. E. Kinkead, consulting engineer, will speak on "Influence of Welding on Design and Production." Papers at the afternoon session will be: "Manufacturing Quantities for the Small Industry," by J. C. Wattleworth, Vlchek Tool Co., and "Operation Study," by R. M. Blakelock, General Electric Co.

Charges 30-Hr. Bill Discriminates Against Steel Construction Industry

WASHINGTON, April 25.—Protest against the proposed 30-hr. bill on the ground that it would discriminate against steel construction in favor of reinforced concrete, masonry and lumber because the measure would not cover construction has been filed with the House Committee on Labor by V. G. Iden, director of public relations for the American Institute of Steel Construction. Hearings were begun today on the bill with Miss Frances Perkins, secretary of labor, the first witness. Miss Perkins testified regarding the draft which she presented to the committee of which Representative Connery is chairman.

Mr. Iden, in his protest, supports his charge of discrimination on the ground that structural steel is fabricated in the shop and shipped to the site to be erected into a bridge or building, whereas reinforced concrete, lumber, masonry and other forms of construction are fabricated at the site and therefore would be considered part of the construction work.

"Unless this discrimination is removed, steel construction would be penalized in its competition with other form of construction," Mr. Iden points out. "Inasmuch as steel construction constitutes the largest market for steel mills of the United States the problem imposes a hardship even beyond the confines of our immediate membership."

Additionally, Mr. Iden says that the steel construction industry is disinclined to recognize the merit of legislating a 30-hr. week in the manufacturing industries. The view is expressed that the legislative prohibition of the hours of work will encourage the manufacturing plants to install more automatic machinery and thereby displace more labor. Actually, it is stated, this is now being contemplated because of the measure.

"Our industry, and, I understand, the steel industry as a whole, is sincerely endeavoring to spread the work available to give employment to as many men as possible during the depression," Mr. Iden continues. "This is particularly true in the steel construction industry because, both in the shop and in the erection of steel, it is essential that we engage the services of skilled workmen. These trained men are an asset to our shops and we endeavor to 'carry' them over all normal periods of unemployment. Our shops consider their staff of workmen part of their natural equipment. This is a relationship which cannot be created by legislative fiat, but it may be seriously disrupted by an unwise statute."

Foreign Motor Car Sales Gained in First Quarter

Foreign sales of American motor cars by members of the National Automobile Chamber of Commerce increased 19 per cent in the first quarter of 1933 over the corresponding period last year, according to George F. Bauer, export manager of that organization. The countries in which automobile purchases registered the largest gains include Argentina, Sweden, Egypt, Brazil, New Zealand and the Philippine Islands.

Steel and Pig Iron Capacities Revised

The American Iron and Steel Institute has revised its capacity figures of steel ingots, pig iron and ferroalloys as of Dec. 31, 1932. The estimated capacity for production of steel ingots, including basic and acid open-hearth, Bessemer, electric and crucible steel, is 68,199,176 tons, compared with 68,298,956 as of Dec. 31, 1931, a reduction of 99,780 tons. The pig iron capacity is now rated at 50,455,975 tons, compared with 51,740,175 tons as of Dec. 31, 1931, a reduction of 1,284,200 tons. The capacity for production of ferroalloys in blast furnaces is unchanged at 802,400 tons.

Steel ingot producing capacity as of Dec. 31, 1932, was divided as follows: basic open-hearth steel, 58,609,140 tons; acid open-hearth, 881,990 tons; Bessemer, 7,895,000 tons; electric, 792,960 tons; crucible, 20,086 tons. This is an increase of 103,500 tons in basic open-hearth capacity, and a decrease in acid open-hearth, Bessemer and electric steel, while crucible steel capacity is unchanged.

Steel by Barge From Chicago to St. Louis

Inland Steel Co. can take credit for having sent the first barge load of steel shipped direct from the mill over the Illinois waterway. The barge carried 500 tons of structurals, plates and bars for delivery at St. Louis and Memphis.

This shipment, steel producers believe, is the forerunner of a large movement of steel by barge from the Calumet industrial area to consumers in the Mississippi Valley, thereby opening up new trade areas to Chicago mills and restoring to the Chicago area a market extending as far south as New Orleans.

... PERSONALS ...

CHARLES PIEZ, chairman of the board of the Link-Belt Co., Chicago, and active head of the organization for 27 years, is retiring and will move to Washington. He is a founder of the Illinois Manufacturers Association. The chairmanship will be left unfilled.

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EDWIN C. BROWN, chief civil engineer for the Carnegie Steel Co., Pittsburgh, will retire on May 1, after 37 years in the steel industry and its transportation affiliates. He served as a draftsman in the chief engineer's office of the Pittsburgh, Cincinnati & St. Louis Railroad at Columbus, Ohio, from 1883 to 1896, when he became resident engineer on construction of the Butler & Pittsburgh Railroad, now the Bessemer & Lake Erie, and later was in charge of maintenance of way. He was made chief civil engineer for the Carnegie company in 1906. While in that position Mr. Brown designed and constructed the Monongahela Southern Railroad, which was designed to link more closely the steel company's Clairton works and its by-products coke plant with its other plants and operations in the lower Monongahela Valley. He was also president of the Pymatuming Land Co., an organization formed to take over and hold title to lands necessary for the development of the Pymatuming dam project in northwestern Pennsylvania.

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RALPH G. SWEENEY, purchasing agent of the Allyne-Ryan Foundry Co., Cleveland, was elected president of the Cleveland Purchasing Agents' Association at the annual meeting, April 20. EDWARD MANNING, Fisher Body Co., Cleveland, was elected first vice-president; W. E. RICE, Graybar Electric Co., second vice-president, and GEORGE A. COLLIER, Cleveland Automatic Machine Co., secretary-treasurer.

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DANIEL W. MEAD and CHARLES V. SEASTONE have announced their retirement from the firm of Mead & Seastone, Madison, Wis., consulting engineers specializing in hydraulic projects. The business will be continued by HAROLD W. MEAD, CLAYTON N. WARD and HENRY J. HUNT as Mead, Ward & Hunt, 115 South Carroll Street, Madison. Mr. Ward will be chief engineer of the new firm. He formerly was assistant professor of hydraulic engineering, University of Wisconsin, and is a graduate of the University of Michigan.

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E. L. VAN VECHTEN, United Air Lines, Inc., was elected president of the Purchasing Agents' Association of Chicago at its annual meeting held April 20. Other officers chosen were first vice-president, GEORGE A. NEESHAM, Wyckoff Drawn Steel Co.; second vice-president, GEORGE BIRKENSTEIN, S. Birkenstein & Sons Co.; treasurer, A. JARMAN; secretary, F. J. HEASLIP, Fairbanks, Morse & Co.

CHARLES PIEZ

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ALBERT J. ROSENTHAL, newly elected mayor of Fond du Lac, Wis., has relinquished the offices of director and vice-president, Vulcan Mfg. Co., fabricator of structural steel, while holding public office.

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MAX SCHLOSSBERG, formerly identified with the Price Iron & Steel Co., has become associated with the M. S. Kaplan Co., Chicago, dealer in scrap metals.

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HARRY J. FISHER, who has recently engaged in independent sales work, has been retained as consultant in connection with motor-drive applications in the steel industry by the Reliance Electric & Engineering Co., Cleveland. Previous to October, 1931, he was connected with the Reliance organization for 14 years.

EDWIN C. BROWN

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ALBERT G. DAVIS, vice-president of the General Electric Co. in charge of patents, will retire on May 1 after more than 35 years of service. CHARLES E. TULLAR, manager of the company's patent department, has been made a member of the advisory committee and of the engineering council of the company, succeeding Mr. Davis in those bodies.

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E. M. ADAMS, vice-president and general manager of sales for Inland Steel Co., has returned to Chicago from a month's stay in Florida.

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F. H. CHAPIN, president, National Acme Co., Cleveland, has been elected a director and second vice-president of the Cleveland Chamber of Commerce. A. F. ALLEN, secretary and treasurer, American Steel & Wire Co., has been elected a director.

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CHARLES F. ADAMS, Secretary of the Navy in President Hoover's cabinet, has been elected a director of the General Electric Co.

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GEORGE W. NEALE has been appointed district representative for the Northern Equipment Co., Erie, Pa., in Florida, with the exception of Jefferson County and counties west. His office will be at 504 East Lafayette Street, Tampa.

Steel Corporation Reports Loss of $16,730,271 in First Quarter

THE United States Steel Corpn. on Tuesday reported a loss for the first quarter of $16,730,271 before provision for preferred dividends. Directors voted a quarterly dividend of 50c. a share on the preferred stock. The stock now has against it accumulated dividends of $2.50, which must be liquidated before anything is paid on the common stock.

The corporation's operating loss was $3,795,473 compared with a loss of $3,828,272 in the fourth quarter of 1932. The operating loss in the first quarter of last year was $1,136,607.

Including charges for depreciation and depletion but before provision for preferred dividends, the total loss of $16,730,271 in the past quarter compares with $16,729,368 in the previous quarter and with $13,218,549 in the first quarter of 1932.

R.F.C. May Grant Loan For New York Tunnel

WASHINGTON, April 25.—Early action is expected to be taken by the Reconstruction Finance Corpn. on the application of the Port of New York Authority for a loan of $75,000,000 to construct a vehicular tunnel under the Hudson River at Weehawken, N. J. The project will call for 25,000 tons of structural steel. It has not been indicated what the nature of the action of the board of directors of the Finance corporation may be, but sponsors of the project believe it will be favorable to granting of the loan.

The R. F. C. still has under consideration the application for a loan of $100,000,000 for construction of a bridge over the Hudson River at Fifty-seventh Street, New York, calling for about 350,000 tons of steel.

No application has as yet been made for a loan of $30,000,000, which it is said will be asked by Laurence Wilder, representing engineers and financiers, for the construction of a group of plants at Pensacola, Fla. The organizations which it is said will seek the loan are known as Gulf Industries, Inc., and would operate with steel fabricators and other industries in the Birmingham, Ala., district.

Concrete Steel Institute Meets

The ninth annual meeting of the Concrete Reinforcing Steel Institute was held at the William Penn Hotel, Pittsburgh, on April 25. The president reported progress in campaigning against the imports of foreign reinforcement bars during the past year. "The following three steps of our program," he said, "were adopted as basic principles.

"*First*, a Treasury decision was secured from the United States Customs Commissioner requiring the marking of all imported concrete reinforcement bars with the name of the country of origin.

"*Second*, the institute campaigned widely with specifying authorities in sections of the country where our campaign received support from American mills and persuaded several hundred of them to specify American-made bars exclusively.

"*Third*, after specifications called for domestic steel, it was found necessary to prevent the misrepresentation of foreign bars as being domestic material.

"That these steps to eliminate foreign bars were effective may be shown by the following official statistics of the United States Department of Commerce:

"1. The imports of foreign reinforcement bars during the last half of 1932 were only approximately one-fourth as large as those during the first half of the year.

"2. The imports during January and February of 1933 were only about 3 per cent of the imports during the corresponding months last year.

"It is interesting to note that the increase in sales and shipments of our members during the last six months of 1932 was approximately equal to the decrease in tons of foreign imports."

The year witnessed the completion, at a cost of $40,000, of the American Concrete Institute tests on columns. These tests point the way to materially smaller and more economical concrete columns.

Since Jan. 15, when Secretary Beeman resigned, the association's engineer, R. W. Johnson, has been serving in his stead.

OBITUARY

J. BIRCHARD GREEN, president, Chicago Steel & Wire Co., and also president of the Fusion Welding Co., died April 24, after a month's illness. Mr. Green was born in Chicago 47 years ago and received his formal education at the Hyde Park High School and Cornell University, from which he was graduated in 1910 as a mechanical engineer. He was one of the organizers in 1914 of the Chicago Steel & Wire Co. and in 1926 organized the Fusion Welding Co. He lectured frequently on arc welding. He held membership in the American Welding Society and was director of a committee of the Century of Progress.

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HERBERT W. CRAIG, who retired in October, 1930, as district manager of sales for the Republic Steel Corpn., with headquarters at Chicago, died April 21 at Champaign, Ill. He was 52 years old. Mr. Craig started work in the steel industry as stenographer in 1899 with the Republic Iron & Steel Co. Later he was put on the sales force and in 1918 was made manager of sales at Chicago, a position which he held for 12 years. He was born at Joliet, Ill., and was educated in the public schools of that city.

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HAROLD WHITMORE SMITH, until June, 1932, generating apparatus manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh, and widely known throughout the electrical industry, died in Pittsburgh on March 28 after a brief illness. Born in Adelaide, South Australia, in 1886, he was graduated from the University of Adelaide and later attended Columbia University. He joined the Westinghouse company in 1904 and in 1911 was transferred to the sales department with headquarters in Milwaukee. In 1912 he returned to Australia, where he entered the Department of Home Affairs as an engineer. He remained in Australia five years. In 1917 he again returned to the United States, and to the Westinghouse company. For the next nine years he was active in the general engineering department before entering the generating apparatus sales department.

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BURTON ROGERS FELTON, formerly treasurer of the New England Pressed Steel Co., died at his home in Brookline, Mass., April 18, in his sixty-seventh year after a long illness.

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SAMUEL B. JACOBS, president, Vulcan Ingot Metal Co., North Chicago, Ill., died April 17 of heart disease. He was 62 years old. Mr. Jacobs was also secretary and a director of the Silica Brick & Engineering Co., Chicago.

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CHARLES F. KEHR, assistant manager of the Cleveland sales organization of Joseph T. Ryerson & Son, Inc., Cleveland, died in that city April 20, aged 43 years. He had been with the Ryerson company for 18 years and was transferred from Chicago to Cleveland in 1927, when the company established a warehouse in that city. He was a graduate of the Armour Institute of Technology, Chicago.

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WILLIAM MONROE YOUNG, SR., who founded the American Appraisal Co., Milwaukee, with the late John L. Moon in 1896, died at Hollywood, Cal., April 18, aged 87 years. He was born in Lake Mills, Wis., and spent most of his life in Milwaukee until his retirement in 1923. His sons, Victor and William M., Jr., are in charge of the Chicago and New York offices of the Appraisal company, respectively.

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OLIVER W. SABOLD, formerly president of the old Colebrookdale Iron Co., one of the oldest iron companies in this country, died of heart disease at his home in Boyertown, Pa., on April 18, aged 72 years. He became identified with the company as a laborer apprentice in his fourteenth year and advanced to the presidency 28 years later. Mr. Sabold retired in 1930.

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ARNOLD E. FOSTER, who early this year became president of the All-American Steel Products Co., Inc., San Francisco, died in an automobile accident on April 22. For the past three years he had been vice-president in charge of sales on the Pacific Coast for both the Bethlehem Steel Co. and the Pacific Coast Steel Corpn.

Government Control of Industry Proposed by Secretary of Labor

Bill Sponsored by Miss Frances Perkins Would Regulate Production, Wages and Hours of Work

WASHINGTON, April 25.—Proposing highly centralized Government control of industry to a degree never before approached, the bill proposed by Miss Frances Perkins, Secretary of Labor, to regulate production, wages and hours of work is meeting with vigorous opposition at hearings before the House Committee on Labor. Much more rigid than the drastic Black 6-hr. day, 30-hr. week bill, which has passed the Senate, the Perkins measure, laid before the House committee last Tuesday, created widespread astonishment among industrialists of the country.

At numerous meetings, the measure was discussed and with few exceptions widely condemned as turning over to the Federal Government bureaucratic control of the nation's mines, quarries, and industries, leaving to private initiative only the prerogative of meeting the payroll.

This sweeping dictatorship would be assumed by Miss Perkins as Secretary of Labor. Though declared unconstitutional by prominent legal minds, Miss Perkins does not accept that interpretation of the measure and is energetically insisting upon its passage. While she speaks of it as an amendment to the Black bill and denies that it contemplates nation-wide control of production, reading of her bill discloses that it is so broad that it would supplant the Senate measure and give to the Government absolute control not only of production, but also of wages and hours of employment.

President's Position Not Known

The White House has made no statement as to its attitude toward the bill, but inasmuch as it has been submitted by the Secretary of Labor it is assumed it has the approval of President Roosevelt, though he may be amenable to sharp revisions. It is reported that the bill is chiefly the product of Dr. Harold G. Moulton, president of the Brookings Institution, Washington, and Dr. Meyer Jacobstein, president of a Rochester, N. Y., bank and a former member of the House of Representatives. Cooperating with them in drafting the measure, it is understood, was Col. Frederic A. Delano, uncle of President Roosevelt.

The sweeping character of the bill is said to have surprised members of the House Committee on Labor. A number of the committee have looked askance at the bill as to its constitutionality, just as Speaker Rainey has questioned the constitutionality of the Black bill. Moreover, the protests coming from the country prompted Chairman Connery of the Committee to invite industrialists, organized labor leaders and others to appear at the hearings on the bill. It has met with objection from some members of the committee, as well as from organized labor and industrialists, because it omits the clause carried in the bill of Chairman Connery which would forbid importations produced by labor engaged more than 6-hr. a day or 30-hr. a week, precisely as domestic articles are forbidden interstate transportation where labor is engaged longer work days or work weeks than those periods. President Roosevelt is opposed to the foreign ban amendment, Miss Perkins told the House committee. Soon afterward, the committee voted, 11 to 4, in favor of the amendment, reflecting a breach between the committee and the administration.

"If we forbid interstate transportation of articles made in domestic plants where men work more than 6-hr. a day or 30-hr. a week, we must extend the same prohibition to imports," said Chairman Connery. "If we don't, foreign goods manufactured at less than cost will flood the country and we will have 20,000,000 unemployed instead of 13,000,000."

Revision of Bill Probable

Members of the committee freely predict that the differences in views between the committee and the administration will make revision necessary if the bill is to be passed. In an analysis of the bill, James A. Emery, counsel for the National Association of Manufacturers, declared that if drastic restriction is applied to domestic industry and not to competing foreign production, it places all American establishments within the terms of the Perkins bill, at an immediate and overwhelming disadvantage with competing commodities, especially from depreciated currency countries. Such arbitrary discrimination, he said, "would handicap our employing capacity when we can least afford to do it."

Organized labor is also opposed to the feature of the bill which, in effect, would establish minimum wages. Organized labor appears to be afraid that they would become maximum wages, thus preventing it from asking for higher scales.

Mr. Emery pointed out that manufacturers are neither opposed to a shortened work week or day nor to spreading employment by every practical method during the existing emergency. As a group, he said, they have been doing this by every means applicable to their conditions of operation, to a greater degree and more successfully than in any other employment.

The bill, like the Black measure, plainly would work extreme hardship, if it would not be impossible of application, to steel and other continuous industries. Unlike the Black bill, the Perkins draft is proposed to be made permanent.

Designed, according to its sponsors, to balance production and to eliminate unfair competition, output would be closely controlled. This would be done through a provision that "If it shall be found by the Secretary of Labor after due investigation that the operation of any plant or plants or enterprises * * * is disturbing and preventing a fair balance of production in the industry involved and is bringing about overproduction or unfair competition in interstate commerce by reason of excessively long period of operation and thereby causing extraordinary hardship to other plants or enterprises * * * the Secretary of Labor upon publication of such finding shall be authorized to specify a limitation that should be imposed upon the total hours of operation * * * so as to bring about a more equitable adjustment of production," etc. Articles thereafter produced out of this so-called balance would be denied interstate shipment.

Wage boards are provided for each industry. The bill authorizes the Secretary of Labor "on a finding that a substantial number of workers in any industry are being paid a wage not fairly and reasonably commensurate with the value of services rendered to set up wage boards" to determine what the fair or commensurate wage would be. The Secretary of Labor would then be authorized to publish a so-called directory order of the names of employers failing to pay the wage determined upon. They would be given 30 days in which to meet the wage requirement. After 30 days, if still failing to pay the wage fixed by the board, an employer would be subjected to penalties. The Secretary of Labor also would be authorized to inspect all the establishments covered by the measure, to require the maintenance of records desired, and to employ those necessary to enforce the law. The minimum wage provision would be enforced by the publication of the names of those who do not pay the wage, this to be followed by the "directory order."

Sound-isolating features characterize a new motor base which has been developed by the General Electric Co. Floating members are suspended on the isolating material, so inclosed and mounted as to secure long life and freedom from damage. Belt tension and motor alinement are maintined in the ordinary manner.

Machine Tool Exhibition Indefinitely Postponed

The machine tool exhibition scheduled to be held in Cleveland next September has been indefinitely postponed. Announcement to that effect was made Tuesday during the spring meeting of the National Machine Tool Builders' Association in Cleveland. The members in a vote taken by mail were almost unanimous in favor of the postponement.

Symposium on Cast Iron In Chicago in June

A symposium on cast iron is to be one of the technical features of the 1933 annual meeting of the American Society for Testing Materials, which will be held at the Stevens Hotel, Chicago, June 26 to 30. This will be sponsored jointly by the American Foundrymen's Association and the A.S.T.M., as the third in a series in which the two societies have cooperated to provide the engineering profession with authoritative data in concise form on the properties of castings produced by the best present methods of production. Malleable iron and steel castings have been previously covered.

Some of the topics which will be covered include: Alloy irons, with data on chromium, molybdenum, nickel, titanium and vanadium; machineability and wear; corrosion and corrosion-resistant iron castings and heat-resistant cast irons; white and chilled irons; heat treatment, and welding.

Tentative plans schedule the session in which the symposium will be held for Monday, June 26. This time has been chosen for the convenience of those who will be attending another joint meeting of A.F.A. and A.S.T.M., on Friday, June 23, the last day of the A.F.A. annual convention, at which an extensive discussion on specifications and tests for cast iron will be given.

Included in the joint committee which is preparing the symposium are the following: H. Bornstein, chairman; D. M. Avey, A. L. Boegehold, J. W. Bolton, F. B. Coyle, H. W. Gillett, A. E. Hageboeck, R. E. Kennedy, J. T. MacKenzie, R. S. MacPherran, Oliver Smalley, E. K. Smith, E. R. Young.

Iron and Steel Meeting In London in May

The annual meeting of the Iron and Steel Institute will be held May 4 and 5 at the quarters of the Institution of Civil Engineers, Great George Street, Westminster, London. The new president, William R. Lysaght will be inducted into office, Dr. W. H. Hatfield will be given the Bessemer gold medal (which was established through funds left by Sir Henry Bessemer to reward distinguished metallurgical work), the first report of the steel castings research committee will be presented and a list of papers will be read, including the following:

Coke consumption in the blast furnace, by D. F. Marshall and Prof. R. V. Wheeler, Sheffield University.

External heat loss of a blast furnace, by D. F. Marshall.

American blast furnace design and practice, by W. A. Haven, Arthur G. McKee & Co., Cleveland.

Structural changes in hypo-eutectoid steel on heating, by Sir H. C. H. Carpenter, Imperial College of Science and Technology, South Kensington, and J. M. Robertson, Royal School of Mines, London.

Corrosion-fatigue tests, by H. J. Gough and D. G. Sopwith.

Formation of columnar crystals in steel sheets after normalization, by F. Kinsky.

Inclusions in steel, by Prof. A. M. Portevin, Paris, and R. Perrin.

Influence of phosphorus on hardening and tempering of cast iron, by J. E. Hurst.

Effect of sulphur and phosphorus on the corrosion of iron, by L. Tronstad and J. Sejersted.

Failures of internal combustion engine exhaust valves, by C. C. Hodgson.

Properties of austenitic steels, by L. B. Pfeil, research laboratory, Mond Nickel Co., Ltd., Birmingham, and D. G. Jones.

Intergranular corrosion of the 18-8 stainless steels, by E. C. Rollason.

The institute will hold its autumn meeting at Sheffield, Sept. 12 to 15, inclusive, with the last day set apart for visits to iron and steel works of the district.

Pipe Lines

Shell Petroleum Corpn., Shell Building, St. Louis, is completing surveys for 6-in. steel pipe line from new Lucien, Okla., oil field, near Perry, Okla., to connection with main trunk system from Tonkawa, Okla., oil fields to Cushing, Okla., about 25 miles.

Pure Oil Co., Chicago, in cooperation with Sun Oil Co., Philadelphia, let contract to Ford, Bacon & Davis Construction Corpn., New York, for 6-in. welded steel gasoline pipe line from refineries at Toledo, Ohio, to point near Detroit, about 90 miles. Contractor is purchasing about 4000 tons pipe in equal amounts from Youngstown Sheet & Tube Co., and National Tube Co. Project will include erection of two large pumping plants.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 2 for 1130 ft. of 12-in. welded steel pipe for Eastern and Western yards (Schedule 9951).

El Paso Natural Gas Co., El Paso, Tex., plans welded steel pipe line from gas fields to Tucson and Phoenix, Ariz., about 200 miles, for commercial natural gas supply at latter points. Cost about $2,100,000.

United Gas Public Service Co., Houston, Tex., has authorized installation of 10-in. welded steel pipe line from Van, Tex., natural gas fields to vicinity of Mineola, Tex., where connection will be made with main east Texas trunk system, about 15 miles.

Moran Corpn. of Texas, Conroe, Montgomery County, Tex., has asked bids for 10-in. steel natural gas pipe line from Conroe gas fields to point near Houston, Tex., about 35 miles. Cost about $85,000.

Bureau of Reclamation, Denver, will take bids April 28 on 226 tons of 1-in. o.d. tubing, and 162 tons of ¾-in. standard black steel pipe.

Cast Iron Pipe

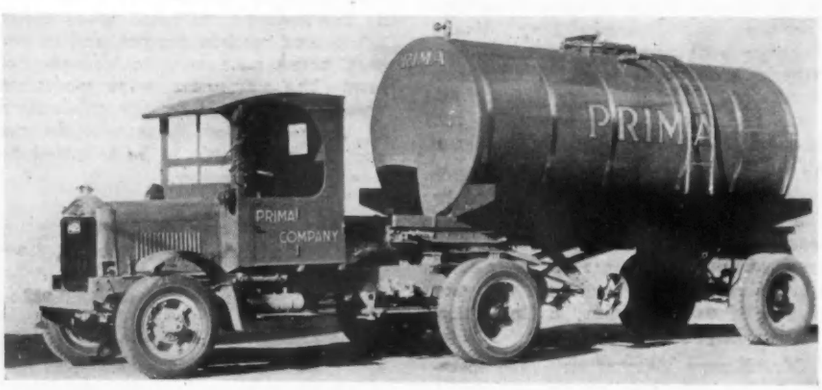
Washington Water Power Co., Spokane, Wash., plans installation of 6- and 8-in. pipe line at Clarkston, Wash.

Belmont, Cal., plans installation of 8-in. pipe line for water service. Fund of $45,000 is being arranged.

San Fernando, Cal., will take bids on 375 tons of 6- and 8-in.

Alhambra, Cal., will vote June 6 on a bond issue for construction of a pipe line requiring 3024 tons of 24-in.

Los Angeles will take bids soon on 5700 ft. of 60-in. for White Point Outfall sewers.



Rustless Steel in Beer Truck

THIS 3000-gal. beer transport tank, for hauling beer from brewery to branch bottling plant, is made of No. 10 gage Enduro stainless steel, produced by the Republic Steel Corp., Youngstown, Ohio. All welded seams and inside surfaces are polished. The tank is insulated with 2 in. of cork and is incased with an outer jacket of No. 14 gage aluminum. The tank was manufactured by the Groen Mfg. Co., Inc., Chicago, for the Prima Co. of the same city.

• • EDITORIAL COMMENT • •

A New Spirit At Work

ONE marvel has trod upon another's heels at Washington, so fast has the procession of acts of Congress moved in these last seven weeks. It is probably no exaggeration to say that these few weeks have produced more epoch-making legislation than an entire four years of any one of a dozen other administrations that could be named.

As great a marvel as the legislation put through since the Thursday following March 4 is the amazing change that has taken place in American thinking and temper. There is almost a complete about-face from a condition in which our people were disagreeing bitterly about everything to one in which their thinking has been almost entirely about things on which they were willing to agree. Certainly not since the Civil War had there been such virulence and violence in political attack as marked the war waged in Congress and in the press over the policies and proposals of the last administration.

That we actually have passed out of the phases of the depression in which the recriminations of a distressed and exasperated people have spent themselves, so that reason and conciliation may do their work, may be too much to say. But there can be no question of the powerful effect upon the public mind of the truce that has come after three and a half years of bitter warfare. Moreover, seeing that willing acceptance of leadership in a grave emergency has been so salutary, the people are apt to go farther in support of what their President would have them do to make bad times better.

No matter with what surprise many now find themselves going with the majority; this experience in pulling together will be a tremendous factor in business recovery. In their distress the people have called long and loudly for a leader—such a leader as they did not find in sight. It may soon appear, as business skies brighten, that what was most lacking was not so much a leader as the will to accept leadership and stop fighting.

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Steel Wages Vs. Steel Prices

WAGES in the steel industry on an hourly basis have not been deflated nearly so much as steel selling prices, according to an interesting compilation made by one large company. In view of the fact that few steel mill employees are working a full week, the average hourly earnings of all employees of the production departments were taken as a basis against which were compared the average prices for finished steel as shown by THE IRON AGE composite price.

Thus, in 1914, the hourly earnings were 25.4c. and the steel price $28.68 a ton, or about 113 times the wage rate; in 1916, wages averaged 30.9c. per hr. and the steel price was $53.42, or 173 times wages; in 1923 the wage rate was up to 53.6c. and the steel price to $55.50, or 104 times wages; the actual deflation of steel prices as compared with wages is shown by the 1932 comparison—53.2 per hr. against an average steel price of $39.14, or only 74 times the wage rate.

During this year THE IRON AGE average of steel prices has further declined, and now stands at $37.58 a net ton, a decline of $1.56 from the 1932 average, though there has been no further reduction in average hourly steel wages.

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The Inflation Scare

THE sweeping provisions of the Thomas measure, now before Congress, would give the President discretionary authority to resort to virtually all of the inflationary expedients that have thus far been proposed. But the granting of such authority does not make its exercise a certainty. We suspect that the new President, in seeking these powers, is again demonstrating his native political shrewdness. To be given authority to do something within one's discretion is quite different from being *forced* to do it by specific Congressional enactment. Undoubtedly the President knows enough about human nature to avoid committing himself as to how he would use the powers that the Thomas amendment would give him. He must be aware that fear of inflation may well prove as effective as inflation itself in setting in motion a wave of commodity buying.

Already the markets have reacted. Purchasing officials of some of the largest industrial organizations are covering their material requirements as far ahead as the willingness of vendors will permit. This inclination to buy, fortunately, comes at a time when replenishment purchasing had already assumed broad proportions. The recent gain in steel business, for instance, has been due almost entirely to purchases of actual replacement needs by a wide variety of consumers.

If, under the threat of inflation, buying and its concomitant, industrial activity, gather sufficient momentum, consideration of so-called inflationary proposals will become unnecessary. The "scare" remedy may be what we require. Even now astute buyers, schooled to caution by errors of judgment in the past three years, are venturing the opinion that the lowest prices of the depression are definitely behind us.

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Practical Objectives for Research

RESEARCH work, like many other activities, is apt to ride along smoothly in good times, but hit plenty of ruts and bumps during a depression. Just now, when management is finding it necessary to wield vigorously the financial pruning shears, the research department is under critical inspection regarding its place in the scheme of things.

A research program is especially difficult to evaluate because of its intangible as well as its tangible benefits. It is virtually impossible to apply a measuring stick which will reveal exact values. Probably the closest approach is the formula suggested several years ago by Dr. F. O. Clements, technical director of General Motors Research Laboratories. At that time he declared that "a research project, to be worthy of a place on our program, should do one or more of the following things: (1) reduce costs of production; (2) reduce operating costs to the user; (3) increase the utility of the product; (4) increase its sales appeal; (5) produce new business, and (6) determine technical information contributory to some other project.

Plans to "Regiment" Industry Are Arousing Opposition

WASHINGTON, April 25.—The House Labor Committee has received an extremely large volume of protests from all sections of industries covered in the 30-hr. week bill, and that it will have to be modified, if it is to be enacted, appears clear. Organized labor is among the strongest protestants, and will present its views tomorrow through President William Green of the American Federation of Labor. Organized labor especially objects to a proposed minimum wage and the setting up of wage boards to establish wages. Organized labor wants to be free to demand higher wages whenever it desires. It is already pushing a campaign for higher wages on the ground that the proposed inflation program of the Administration will increase commodity prices and therefore increase the cost of living.

There are reports that, realizing the force of argument that a minimum wage cannot be constitutionally set, proponents of the bill are considering amendments to force industry to accept the bill. One amendment, also held by many to be unconstitutional, it is said, would grant immunity from the Sherman law to those operating under the 30-hr. law. Another amendment reported to be in contemplation, and likewise held by many to be unconstitutional, would permit the loaning of Reconstruction Finance Corporation funds to industries operating under the law.

The bill is said to be a part of the so-called plan of the Administration to "regiment" industry. Vague though reports of the plan are, it is said that one proposal being considered as a part of the program calls for the setting up of a sort of an industrial council to advise with Government officials in working out a program of industrial planning, such as control of output and distribution, seeking to strike a balance between supply and demand. It is said this council would cooperate with Secretary of Commerce Roper and that he has already selected 21 men from representative industries as a forerunner of the inauguration of the program. So far no information has been given out by the Administration, but it is reported that it soon will be announced. Originally, it is reported, the council was to be chosen to represent specific industries. Difficulty is understood to have been met in selecting the industries because of the possibility of the charge of discrimination against industries not represented. For this reason, it is said, the council has been proposed as a "geographical" rather than a strictly "industrial" group.

British Iron and Steel Markets Show Post-Holiday Upturn

LONDON, ENGLAND, April 25 (*By Cable*).—British markets are recovering after the holidays. Home demand for pig iron and steel is increasing, but export business is slow. Tin plate prices are steadying because of the firmer tendency of the tin market. Tin plate business is quiet, but many works are still well booked on contracts placed early in year. Fair inquiries are out for the second half.

The Continental steel market has been affected by the suspension of gold payments by the United States, and also is awaiting the outcome of cartel deliberations. Many big plants are still out of the market. Others are holding firmly to present gold prices. British users are showing little interest in Continental steel in spite of cheaper sterling prices due to exchange movements.

Belgian industrialists are confident of the success of final negotiations for cartel sales offices, but the Germans are less hopeful. More Lorraine blast furnaces are relighting.

British Prices f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 to £6 7s. 6d.
Black sheets, Japanese specifications	£11
Tin plate, per base box	15s. 6d. to 15s. 9d.
Steel bars, open-hearth	£7 17½s. to £8 7½s.
Beams, open-hrth.	£7 7½s. to £7 17½s.
Channels, open-hearth	£7 12½s. to £8 2½s.
Angles, open-hearth	£7 7½s. to £7 17½s.
Black sheets, No. 24 gage	£8 10s.
Galvanized sheets, No. 24 gage	£10 10s. to £10 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at $4.86

Billets, Thomas	£2 5s.
Wire rods, No. 5 B.W.G.	£4 10s.
Black sheets, No. 31 gage, Japanese	£11 5s.
Steel bars, merchant	£2 12s. 6d. to £2 15s.
Beams, Thomas	£2 8s.
Angles, Thomas 4-in. and larger	£2 9s.
Angles, small	£2 12s.
Hoops and strip steel over 6-in. base	£3 10s. to £3 12s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

Sheet Sales Gained in March, Also Shipments

While both sales and shipments of sheet mill products during March registered slight increases over the preceding month, production by members of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, representing a monthly capacity of 330,000 net tons, declined rather sharply from 91,723 net tons in February to 64,724 tons in March. These producers comprise approximately 60 per cent of the country's sheet capacity of 550,000 net tons monthly. Sales of member companies last month amounted to 83,295 net tons, as compared with 80,550 tons in February, while shipments totaled 74,880 tons and 72,772 tons respectively. Unfilled tonnage rose from 83,760 tons on March 1 to 91,993 tons on April 1. The March report, with comparisons of the two preceding months in net tons, follows:

	March	Feb.	Jan.
Sales	83,295	80,550	75,615
Production	64,724	91,723	85,337
Shipments	74,880	72,772	79,234
Unfilled orders	91,993	83,760	77,509
Unshipped orders	43,407	43,392	39,952
Unsold stocks	52,199	57,296	54,831
Capacity per month	550,000	550,000	550,000
Percentage reporting	60.0	60.0	60.0
Percentages, Based on Capacity			
Sales	25.3	24.4	22.9
Production	19.6	27.8	25.9
Shipments	22.7	22.1	24.0
Unfilled orders	27.9	25.4	23.5
Unshipped orders	13.2	13.2	12.1
Unsold stocks	15.8	17.3	16.6

Conveys Fine Materials by Compressed Air

A pneumatic transport system for conveying cement, pulverized coal and other fine materials has been developed by the Kennedy-Van Saun Mfg. & Engineering Corpn., 2 Park Avenue, New York. The material to be carried is discharged from a bin into a weighing tank which is automatically filled and emptied by air pressure into a discharge line, which may deliver to some point of use or storage. Each time the tank is filled, an automatic closure valve built into the top of the tank seals the tank during the period of discharge. The number of discharges may be recorded, and as the tank will not discharge until sufficient weight of material has been received to operate the valves, the number of discharges is a meausre of the total material transported.

SUMMARY OF THE WEEK'S BUSINESS

Steel Ingot Output Rises Further; Sharp Advances in Scrap Prices

Rate of Steel-Making Activity Up to 25 Per Cent—Demand for Products Broadening—Heavy Melting Scrap Up $2 at Chicago, $1.25 in Eastern Pennsylvania

SHARP increases in scrap prices, amounting in some instances to as much as $2 a ton, further strengthening of pig iron quotations, the elimination of many of the concessions that have been granted to finished steel buyers, the prospective blowing in of additional blast furnaces, and an expansion in the rate of steel ingot production to 25 per cent of the country's capacity against 23 per cent last week and 15 per cent at the beginning of the month are indications of the broadening activities in the iron and steel industry and among the consuming industries that use iron and steel as their principal raw materials.

The present rate of steel output is the highest for any week since March, 1932. Moreover, the volume of incoming business this month has been the largest for many steel companies in fully a year. The steel industry is now quite confident that the recent acceleration will continue at least through May, with prospects beyond that time more or less dependent upon developments at Washington that are now in the making, particularly with respect to various inflationary measures before Congress, including the proposed bond issue for public works.

Thus far, however, the improvement that has occurred in steel buying is almost wholly of a non-speculative character. While some steel consumers would like to cover their requirements for the third quarter or even the entire last half at present prices, steel companies are discouraging such efforts and probably will put into effect price advances on some products, sheets and strip steel in particular, before the time arrives for third quarter contracting. Motor car makers would like to escape the payment of higher steel prices, and one important company is considering the purchase of a considerable quantity of steel to put in stock as a protection against a higher steel cost.

THE automobile industry is still in the forefront as a buyer of steel. Further large orders are expected within two weeks on top of a heavy tonnage placed in the past week. Motor car output is rising, as retail sales expand, and schedules for May indicate that April output of about 150,000 cars will be considerably exceeded next month. Automobile manufacturers are pushing steel mills for deliveries. Truck shipments of steel have been rushed to parts makers so that motor car schedules would not be disrupted.

Tin plate specifications are second only to automobile requirements in increasing the average rate of steel production. Tin plate output in the entire country has risen above last week's rate of 50 per cent. The Wheeling district, where tin plate is an important item of manufacture, is operating at well above 50 per cent of capacity.

There has also been a further increase in miscellaneous business, which, with automobile tonnage, has lifted sheet mill schedules to 30 per cent, strip mills to 35 per cent and bar mill schedules to 25 per cent.

Prospects of railroad buying are improving. The Pennsylvania may buy at least 25,000 tons of rails, and some car work in important volume has been decided upon. The American Refrigerator Transit Co. will rebuild 1300 refrigerator cars, the Wilson Car Line will build 50 refrigerator cars in its own shops, and the Interstate Railroad will repair 100 cars.

BECAUSE of the reputed value of the scrap market as a barometer of iron and steel trade conditions, the marked gain in scrap prices this week becomes an item of paramount importance. The Pittsburgh market, which has been strengthening for several weeks, has recorded a further rise of only 25c. a ton on heavy melting scrap, but the Chicago price on this grade has gone up $2, and in eastern Pennsylvania the average price is $1.25 above that of a week ago. In some districts there is a scramble for scrap. The Detroit steel plant may bring in scrap by boat from other points on the Lakes. A shortage of scrap, which is intensified by the fact that many holders are waiting for still higher prices, has caused scrap brokers to become cautious in taking orders, as the advance has been so rapid that some of them are now executing recent contracts without profit. THE IRON AGE heavy melting steel composite price has risen to $8.83 against $7.67 last week, and is now the highest since the first week of October, 1931.

With the recent advance in Southern pig iron prices now in effect, THE IRON AGE pig iron composite has increased to $14.01, a return to the level of June, 1932. Pittsburgh and Valley producers have announced an advance of 50c. a ton on basic pig iron. The finished steel composite price is unchanged at 1.867c. a lb., but does not include galvanized sheets, on which quotations are now $2 a ton higher. All non-ferrous metals have gone up during the week.

IRON and steel exports in March, at 80,567 tons, were the largest for any month since July, 1931. Scrap accounted for 57,522 tons, or 71 per cent of the month's total. Imports in March totaled 22,114 tons, the highest since December.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Apr. 25, 1933	Apr. 18, 1933	Mar. 28, 1933	Apr. 26, 1932
No. 2 fdy., Philadelphia	$14.34	$14.34	$13.34	$15.59
No. 2, Valley furnace	14.50	14.50	14.50	15.00
No. 2 Southern, Cin'ti	**15.82**	13.82	13.82	13.82
No. 2, Birmingham	**12.00**	11.00	11.00	11.00
No. 2 foundry, Chicago*	15.50	15.50	15.50	16.00
Basic, del'd eastern Pa.	14.09	14.09	13.50	16.00
Basic, Valley furnace	13.50	13.50	13.50	14.50
Valley Bessemer, del'd P'gh.	16.89	16.89	16.89	17.39
Malleable, Chicago*	15.50	15.50	15.50	16.00
Malleable, Valley	14.50	14.50	14.50	15.50
L. S. charcoal, Chicago	23.17	23.17	23.17	23.17
Ferromanganese, seab'd carlots	†68.00	68.00	68.00	75.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Contract price; spot quotation $61.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$40.00	$40.00	$40.00	$43.00
Light rails at mill	30.00	30.00	30.00	34.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	27.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	26.00
Slabs, Pittsburgh	26.00	26.00	26.00	27.00
Forging billets, Pittsburgh	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.50

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.95	1.95	1.95	1.95
Tank plates, Pittsburgh	1.50	1.50	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.598	1.598	1.648	1.898
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.86775
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.00
Hot-rolled strips, Pittsburgh	1.45	1.45	1.45	1.40
Cold-rolled strips, Pittsburgh	1.80	1.80	1.80	2.00

Finished Steel

Per Lb. to Large Buyers:	Apr. 25, 1933 Cents	Apr. 18, 1933 Cents	Mar. 28, 1933 Cents	Apr. 26, 1932 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.00	2.00	2.00	2.20
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.10	2.10	2.10	2.30
Sheets, galv., No. 24, P'gh	**2.70**	2.60	2.60	2.85
Sheets, galv., No. 24, Chicago dist. mill	**2.80**	2.70	2.70	2.95
Hot-rolled sheets, No. 10, P'gh	1.40	1.40	1.40	1.55
Hot-rolled sheets, No. 10, Chicago dist. mill	1.50	1.50	1.50	1.65
Wire nails, Pittsburgh	1.85	1.85	1.85	1.95
Wire nails, Chicago dist. mill	1.90	1.90	1.90	2.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill	2.15	2.15	2.15	2.25
Barbed wire, galv., P'gh	2.35	2.35	2.35	2.60
Barbed wire, galv., Chicago dist. mill	2.40	2.40	2.40	2.65
Tin plate, 100 lb. box, P'gh	$4.25	$4.25	$4.25	$4.75

Old Material

Per Gross Ton:	Apr. 25, 1933	Apr. 18, 1933	Mar. 28, 1933	Apr. 26, 1932
Heavy melting steel, P'gh	**$10.50**	$10.25	$9.25	$10.00
Heavy melting steel, Phila	**8.25**	7.00	6.75	7.25
Heavy melting steel, Ch'go	**7.75**	5.75	5.25	6.87½
Carwheels, Chicago	**8.25**	8.00	8.00	7.00
Carwheels, Philadelphia	**9.00**	8.50	8.00	9.50
No. 1 cast, Pittsburgh	**9.50**	9.25	9.00	9.50
No. 1 cast, Philadelphia	8.00	8.00	8.00	9.00
No. 1 cast, Ch'go (net ton)	**8.00**	6.75	6.25	7.00
No. 1 RR. wrot., Phila	**8.00**	7.50	7.50	8.50
No. 1 RR. wrot., Ch'go (net)	**6.00**	4.50	4.50	5.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$1.75	$1.75	$1.75	$2.25
Foundry coke, prompt	2.50	2.50	2.50	3.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	**6.00**	5.12½	4.75	5.50
Lake copper, New York	**6.25**	5.37½	5.00	6.00
Tin (Straits), New York	**30.25**	26.12½	24.25	19.65
Zinc, East St. Louis	**3.70**	3.15	3.00	2.60
Zinc, New York	**4.07**	3.52	3.37	2.97
Lead, St. Louis	**3.37½**	3.12½	2.87½	2.90
Lead, New York	**3.50**	3.25	3.00	3.00
Antimony (Asiatic), N. Y.	**6.12½**	5.60	5.95	5.35

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

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▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
April 25, 1933	1.867c. a Lb.	$14.01 a Gross Ton	$8.83 a Gross Ton
One week ago	1.867c.	13.68	7.67
One month ago	1.923c.	13.56	7.08
One year ago	1.970c.	14.35	8.04
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1933	1.948c., Jan. 3	1.867c., Apr. 18	$14.01, Apr. 25	$13.56, Jan. 3	$8.83, Apr. 25	$6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Steel Business Continues to Improve

Wheeling District Making Steel at Above 50 Per Cent and 25 Per Cent Rate Prevails in the Valleys

PITTSBURGH, April 25.—While orders for finished steel products continue to improve at a moderate rate, mills in the immediate district have not benefited as much as those in adjacent territories.

Demand for structural steel and reinforcing bars has failed to gain except in the number of small miscellaneous orders being placed. In the almost complete absence of Federal projects, large jobs are not numerous, although private ventures have picked up. Railroad buying is still deferred, although the local mill is still engaged on the recent Erie order. Accessories for this purchase have been distributed.

Specifications from the automotive industry are well maintained, and purchases by jobbers have been stimulated by inflation talk. Nevertheless, distributers of steel products, as well as many small manufacturers, are more interested in covering their future requirements than in increasing current releases. Speculative purchases, particularly by large consumers of steel, seem to be lacking. Although many small buyers would like to cover for remainder of the year, steel producers are almost unanimous in refusing to make contracts for a longer period than the current quarter, and in that time no price advance can be made effective. Makers of hot-rolled strip will announce an advance in quotations this week, but the move is more of an attempt to get strip prices in line with the general steel market than a protection against possible inflation. Prices on other steel products are very well maintained.

Steel ingot production in the immediate Pittsburgh district may be estimated this week at 19 per cent. Both of the largest interests in the territory are running their district plants at about this rate. Activity in the rail plant is offset by lower production at a nearby structural mill, and two or three of the large units in the territory still remain idle. Valley and adjacent northern Ohio plants are running at 25 per cent this week, and production in the Wheeling district has risen well over the 50 per cent level. The three large plants in that territory are all being pushed to supply raw steel for tin plate and sheet and strip production. Tin plate output in the country as a whole has risen above last week's 50 per cent rate, and sheet mills are now engaged at about 30 per cent. Strip mills are running at 35 per cent, and bar schedules average about 25 per cent.

Pig Iron

While shipments to small consumers in the district have not improved materially, new inquiry is considerably heavier, and prices are unusually strong. The price of basic iron will be advanced 50c. a ton to $14, Valley furnace, and $14.50, Neville Island, later this week. The other grades are unchanged at $14.50, Valley, for foundry and malleable iron, and $15 for Bessemer. The Pittsburgh furnace price is 50c. higher. The A. M. Byers Co. is in the market for a substantial tonnage of Bessemer iron.

Refractories

Higher steel operations have forced producers into the market for refractory materials, principally for open-hearth and Bessemer furnace use. Inquiry has become very active, and sales are generally for rush shipment. Better demand has served to stengthen prices, and first-quality brick is now generally quoted at $35, per 1000, f.o.b. works. Second-quality material takes the usual $5 differential.

Semi-Finished Steel

A few consumers have been negotiating for contracts within the last week, but are unable to develop prices of less than $26, Pittsburgh or Youngstown, on billets, slabs and sheet bars. Shipments have improved materially in the last two weeks. Forging billets are firm at $31, and wire rods are slightly more active, with the price well maintained at $35, Pittsburgh or Cleveland.

Rails and Track Accessories

The Erie has completed distribution of its orders for accessories, amounting to approximately 4000 tons. Pittsburgh mills shared rather heavily. The Missouri Pacific has withdrawn its projected inquiry for 7000 tons of tie plates. Purchase of 9000 tons of rails, which was authorized recently by the New York Central, is being deferred. Prospective release of a rail tonnage by the Pennsylvania is said to be dependent upon a sale of a substantial tonnage of scrap to consumers which supply the rails. The local rail mill began production late last week on a part of its recent order from the Erie, and will operate through the current week.

Bars, Plates and Shapes

Movement of merchant bars to miscellaneous manufacturing consumers is still increasing, and specifications for plates are somewhat heavier. Structural steel and reinforcing bars are still affected adversely by deferment of Federal projects, but there is a fair movement of small tonnages, principally for improvement and rehabilitation work. Nearby States are beginning their road lettings, but shipments of reinforcing bars for this purpose are not yet very heavy. The railroads are taking scarcely any heavy hot-rolled products, and barge builders are beginning to complete orders placed earlier in the year. Buying of plates by the oil industry is very light.

Prices on bars, plates and shapes have strengthened in the last week, but plates are still weak, particularly when Eastern competition is encountered. Reinforcing bars are well maintained at 1.40c., Pittsburgh, for mill lengths.

Cold-Finished Steel Bars

Shipments are still improving, with the automotive industry and the jobbing trade the principal takers. The base price is well maintained at 1.70c., Pittsburgh.

Tubular Goods

Shipments of standard pipe to jobbers on the usual consignment basis are considerably heavier, as most of them have insufficient stock to meet an increase in demand. Otherwise the pipe industry is rather quiet, as oil country goods are not being purchased and sizable line pipe projects are lacking. Mechanical tubing is somewhat more active, and a better movement of boiler tubes is reported by some producers.

Wire Products

Prospects of inflation have driven jobbers into the market for merchant wire products, and demand in the last week has been more active than in a long while. Some buyers would be willing to cover for the remainder of the year, but producers are contracting only for the current quarter. Manufacturers' wire is also moving in better volume, particularly to the automotive trade. Nail prices are well maintained at $1.85 a keg, Pittsburgh, and manufacturers' wire at 2.10c., Pittsburgh.

Sheets

Specifications last week fell slightly short of the total in either of the previous two weeks, but were still considered very encouraging. The automotive industry is still the principal contributor to current releases, but satisfactory tonnage is coming from refrigerator makers, steel barrel manufacturers and the sheet metal stamping trade. The industry is operating at about 30 per cent of capacity, with the full finishing units occupied at the best rate.

Prices have strengthened throughout the list, and shading has been almost entirely eliminated in most of the leading finishes. The 2.70c. price on galvanized sheets has not received much test as a great many consum-

ers were covered at 2.60c. before the advance was announced.

Tin Plate

Continued heavier specifications have enabled mills to advance production above the 50 per cent rate which has prevailed in the last week. Recent releases are well maintained, but shipments are coming from stock in some cases, and the recent improvement in production has not been as large as the gain in specifications.

Strip Steel

Production of hot-rolled strip is at the best rate in more than a year, and most producers are now able to operate their mills at a fair rate each week instead of on the stagger basis which has prevailed for several months. Orders are largely for immediate delivery, and although small in tonnage the aggregate is fairly satisfactory. Hot-rolled production averages about 25 per cent of capacity, but cold-rolling units are not nearly so well engaged.

An advance of $2 or $3 a ton in hot-rolled strip prices is likely to be announced before the end of the week. A change in cold-rolled quotations is less likely, although mills may attempt to stabilize the price at 2c., Pittsburgh or Cleveland.

Coal and Coke

Demand for foundry coke is slightly better, but the improvement has not been as impressive as in other basic commodities. The furnace grade is very quiet, and prices continue rather weak. An advance in coal prices is being mentioned, but producers have not yet taken a definite stand. Some negotiations for Lake shipments are under way.

Scrap

An advance of 25c. a ton in the heavy melting quotation this week is by no means fully indicative of the recent gains in strength in the scrap market. While small sales to consumers have been made at $10.50 and $10.75, dealers would not sell a tonnage at these figures, and the current quotation is largely nominal. A large Valley consumer is reported to have purchased about 50,000 tons of railroad scrap for its two local plants. A sale of scrap by the Pennsylvania to its three principal sources of rails cannot be definitely confirmed. Hydraulic bundles are unusually strong in the absence of shipments from Michigan points. No. 2 steel has been sold at more than $9, and dealers are paying this price to cover. Machine shop and blast furnace turnings have also advanced, along with most of the foundry grades. Nevertheless, foundry purchases are still limited, and scrap for cupola melting is hardly as strong as the steel-making grades. Further sharp increases in scrap prices may be developed by consumer purchases as soon as the Federal financial program is more clearly defined.

Valley Steel Business Showing Marked Gain Over March

YOUNGSTOWN, April 25.—Finished steel tonnage reaching Valley and nearby northern Ohio mills this month is running 75 to 100 per cent ahead of March. The average for the two months is well ahead of February, and the effects of the March dip, occasioned by the banking moratorium, seem to have been entirely obliterated. Shipments to the automotive industry are outstanding, and movement of bars, sheets and strip steel is naturally reflecting the most benefit. Nevertheless, tin plate specifications have turned upward sharply and operations of Valley tin mills are averaging about 70 per cent of capacity. Demand from the other large consuming industries is more restricted, but much improvement has been shown in the requirements of small manufacturing consumers and jobbers. The latter reacted almost immediately to inflation plans announced last week in Washington and many are seeking coverage even though they have not increased their immediate requirements markedly.

The oil and gas industry is still a problem to Valley mills and its takings have failed to improve materially. However, standard pipe is moving somewhat more actively, and a number of line pipe jobs are being talked of which will likely benefit the industry later in the year.

Activity in fabricated plate is still rather limited, but new inquiry is larger. Jobs now being taken are mostly small, and the brewing industry has not contributed much tonnage of this sort to local mills. Demand for barrel hoops has been considerably heavier in the last month, but the tonnage involved is not large. Fabricators in this district are experimenting with steel barrels and bottle cases for the brewing trade, but have not reached a production basis on such products. This is equally true in the case of corrosion-resisting steel. While this material is thought to offer large potentialities to the brewers, much research work will be required before adaptation is successfully achieved.

Steel ingot production in the Greater Youngstown district is expected to average about 25 per cent of capacity this week, the highest rate of the year. Output is also running ahead of the corresponding period in the previous year for the first time since 1929. At some plants all open-hearths are being utilized which can be run without considerable repair, and steel companies are inquiring for refractories and other supplies and equipment needed. Only one blast furnace has come into production during the current business improvement, but one large producer has no surplus stocks of pig iron and must raise its iron making rate almost as rapidly as Bessemer and open-hearth steel production go up. Sheet mills are engaged at 30 per cent or better and hot-rolled strip is almost as active. Bar units are running at about 25 per cent. Pipe mills are making the poorest showing.

Talk of advances in steel prices is heard, but producers have withdrawn no quotations, and if increases are undertaken, they will be made in the usual way, allowing for coverage over the remainder of the quarter in most instances. Strip steel is most likely to be advanced, although sheet prices would soon be affected if any general mark-up were contemplated.

Pig iron continues rather quiet, although a little inquiry for future requirements is appearing. Shipments have not increased materially, as foundries are ordinarily the last to feel business improvement. Scrap is very strong, and two of the large consumers in the district have made substantial purchases in the last week or two. Dealers are unwilling to take orders at current quoted levels, but actual purchases have not advanced the market on No. 1 heavy melting steel above $10 to $10.50.

Scrap Prices Stronger in Boston Market

BOSTON, April 25.—Pig iron sales the past week were a little larger, amounting to about 1600 tons. They included Buffalo iron at the new prices of $14.25 a ton, furnace, for No. 2X, and $14.50 for No. 1X, Mystic iron at higher prices, and Pennsylvania and Indian irons. In line with the action taken in other parts of the country, the Mystic Iron Works has reestablished 25c. silicon differentials on foundry iron, with a 50c. a ton advance for malleable over corresponding foundry silicons. The base price has not been disturbed. Prices on Indian iron were temporarily withdrawn due to the excited foreign exchange market. Dutch iron is still offered to Providence, R. I., melters at $14 a ton, delivered, and foundries claim it is still possible to obtain eastern Pennsylvania iron at $13 a ton, base, furnace.

Scrap dealers have established new prices, which in many cases show advances up to $1 a ton. For No. 1 heavy melting steel, $4 to $4.25 a ton, on cars shipping point, is offered, which is about in line with the Pittsburgh market, allowing $5.83 a ton freight and 25c. selling commission.

Thomas Spacing Machine Co., Glenshaw, Pa., has been given contract by the City of Pittsburgh for repairs to 1100 voting machines. Total cost will be approximately $123,000.

Demand Gathers Momentum in the Chicago District

Steel Output Now Above 25 Per Cent—Pig Iron Shipments Gain and Scrap Prices Forge Upward

CHICAGO, April 25.—Chicago ingot production has gained more than a point, now standing slightly above 25 per cent of capacity, and prospects for further increases are excellent, since both new sales and inquiries are the best of the year.

Of great importance in the market, as it now stands, is the gradual broadening of demand. Barrel, container, shelving and locker manufacturers are once again taking steel in substantial volume. Through their assistance some hot mills have pushed up production to 50 per cent of capacity. Track accessories are moving faster and the wants of automobile manufacturers are still increasing.

Pig iron shipments in April promise to be double those of March, and there is a veritable scramble in the scrap market.

Prices are firm, some of them being on a firmer footing than in 1929. The recently advanced quotations on galvanized sheets are holding, and plate quotations, which weakened momentarily under pressure from producers to the south of Chicago, are again well stabilized. Heavy melting steel is strong at new high prices and the scrap list generally is working to higher levels as one purchase follows another. Pig iron is firm at $15.50 a ton, local furnaces, and most foundrymen have their minds made up that higher prices are in the offing. That producers of iron and steel share this opinion is evidenced by the fact that they are refusing commitments beyond the third quarter.

Pig Iron

April shipments of Northern foundry iron are fully double the tonnage moved in March and new sales are the best of the year. Some foundries which, at the turn of the month, were working two days a week are now on a six-day basis. The status of delivered prices on Southern iron is confusing in the absence of transactions. Southern furnaces appear to want inquiries put to them for consideration. In the meantime the market is generally considered to be $11, Birmingham, or $17.01, delivered, all rail, to Chicago.

Wire Products

Increase in consumption is again noted, but the character is changed as industrial areas climb and rural districts appear to have reached a dead level. Miscellaneous demand is taking a better hold, and the automobile industry is in need of increasing quantities of wire and wire product. The farmer unquestionably feels better as grain prices advance, but his cash is limited and his credit is restricted. Reports from the field show that farmers in general are willing at the first opportunity to do extensive maintenance work. The railroads still make very light purchases and public utilities are holding out of the market. It is interesting to note that the bulk of orders on books are in contract specifications.

Cold-Rolled Strip

Leadership in demand by automobile manufacturers has raised output to 25 per cent of capacity. Miscellaneous use, though growing, is still light. Prices are steady in the range from 1.80c. to 2c. a lb. Cleveland and Pittsburgh.

Rails and Track Supplies

Demand for track accessories is growing steadily, but is still far short of normal spring size. The Erie has ordered some of its required track supplies. The rail market is dull. No recent orders have been taken by mills and inquiries are lacking. Both Chicago producers are operating on light schedule.

Structural Material

The only recent award of note in the Middle West is the 6600 tons for the Federal Building in St. Louis. Other awards are light and cover some brewery work, a building for the World's Fair and some highway bridges. Inquiries are extremely light, and the outlook is anything but promising, especially so long as the Government holds a check on its program.

Bars

Bar mills are by far the most active of those which ordinarily produce the heavy tonnages. An increasing flow of orders continues to come from automobile manufacturers, and miscellaneous demand is developing at an even faster rate, the acceleration being particularly pronounced in the last few days. Production has not lost ground in spite of delays in shipping reinforcing bars, which are not moving for Illinois roadwork because of disagreement over the price of cement.

Sheets

Output in this district has reached 50 per cent of capacity, following larger releases by automobile manufacturers, as well as new tonnages from barrel, locker, shelving and pail manufacturers. Diversified interests are more active in the field covered by hot mills than in any other part of the steel market. Prices for galvanized sheets are reasonably steady at the new level established a week ago.

Plates

Orders are confined to a few scattered tanks and some tonnage of very light plates that is going into the manufacture of beer barrels. Railroad shops, although employing more men, are not taking more steel. The report that the Chicago & North Western has ordered 700 cars is not correct.

Cast Iron Pipe

Small inquiries and less than carlot orders are more numerous, but the market lacks the support of real tonnage business. On the basis of business that is going from day to day prices are firm. It is reported that Milwaukee is seeking a loan of $4,000,000 from the R.F.C. for improvements to its water system.

Reinforcing Bars

The Chicago Carton Co.'s project, requiring about 1000 tons, is before the trade. Otherwise the market is very quiet and prices are being tested only on small lots. A price controversy between State officials and cement manufacturers is holding up most of the Illinois road program. Contractors have stopped ordering out bars and mill shipments are sharply down. Indiana is announcing low bidders on recent road lettings. Necessary bars will be bought by the contractors. Tonnages for breweries are available only in very small lots.

Scrap

Events have moved rapidly and heavy melting steel has reached a new high at $8 a gross ton, delivered consumers' yards, and other grades are moving up in sympathy. Purchases represent no important increase in volume. This sudden rise in prices will forestall movement from Chicago by boat except for those deals which have already been closed. A boat is leaving Green Bay, Wis., for Lake Erie, and it is reported that 16,000 tons will move likewise from north of Chicago. About 10,000 tons will move from Chicago docks. Trading is unquestionably the best of the year and inquiries point to a more active market.

Screw drivers having a solid, forged one-piece blade heat treated throughout its entire length have been placed on the market by the Bonney Forge & Tool Works, Allentown, Pa. The tips are accurately ground to assure non-slip fit in screw slots. Handles are of a tough composition which is a non-conductor of electricity, and are fluted to provide secure grip. Five styles are produced in a total of 13 sizes.

Eastern Pennsylvania Trade Shows General Improvement

Ingot Output of District Rises to 13 Per Cent—Steel Scrap Advances Sharply

PHILADELPHIA, April 25.—The iron and steel trade in this district generally reports more active specifying for finished material, the scrap market has taken a further sharp advance and there is a distinctly better feeling in most sections of the market. A number of makers report that orders the past week were the largest for a long time. One maker reported that the volume of business received was the largest since last August. On the other hand, some makers report little or no change. One mill says April sales are running about 10 per cent below those of March.

There is a difference of opinion as to the effect of the administration's inflation program. Some believe that it has stimulated coverages by consumers and considerably increased their interest in the market, believing that a general rise in prices is near at hand. Others are of the opinion that it will be a week or so before the trade will see the effect of the inflation program. Generally the program is approved, though with the provision that it be kept under control.

The increase in orders covers diversified lines, but applies especially to merchant bars and sheets. With gains in railroad carloadings and a probable insufficient inventory on hand, it is reported that the Pennsylvania Railroad may come into the market soon for a minimum of 25,000 tons of rails. The steel trade believes that rail orders in 1933 will see an increase over the light orders of 1932, the smallest in 66 years. There are also reports that the Pennsylvania may soon make a large offering of scrap.

There is a scarcity of old material in this district, which is reflected in the rapid advance of $1 to $1.50 a ton in No. 1 heavy melting steel to $8 to $8.50.

Steelworks operations have increased one-half point to 13 per cent.

Pig Iron

The undertone of the market is stronger. Demand has increased. The average inquiry involves from 200 to 250 tons as against the previous carlot average. Practically all the inquiries are for foundry grades. No. 2 plain continues to be quoted at $13.50, furnace.

Plates, Shapes and Bars

Some makers report an increase in orders and freer specifications, mostly for shapes and bars. The market has stiffened as a result and, should the improvement continue, mills predict higher prices will prevail before the end of the second quarter. Pusey & Jones, Wilmington, Del., is reported to have distributed 875 tons of plates and shapes for a ferry to be built for the Virginia Ferry Corpn. It is said that the material will go to three eastern Pennsylvania mills, 475 tons of standard plates to one, 100 tons of floor plates to another and 300 tons of shapes to a third mill.

Sheets

Sheet mills in this district have been stepped up moderately as the result of an increase in orders and specifications. While most of the business is for full-finished lines for automotive work, some of it is also for commercial grades. The market is stronger and makers are refusing coverage at present prices beyond the second quarter. The Allegheny Steel Co. has received an order for 700 tons of sheets for license tags for the State of Pennsylvania.

Imports

The following iron and steel imports were received here last week: 2340 tons of pig iron from British India and 502 tons of the same product from Asia; 100 tons of spiegeleisen from England; 8 tons of charcoal bar iron, 4 tons of steel bars, 4 tons of steel wire, 2 tons of strip steel and 1 ton of steel tubes from Sweden.

Scrap

The scrap market has taken another sharp advance. No. 1 heavy melting steel has moved up from $7 to a range of $8 to $8.50. Two fair-sized lots were sold to eastern Pennsylvania mills the past week at $8, delivered, since which time mill offers of $8.50 have been declined by dealers. Other grades also have risen in price. Yard stocks are scarce in all steel grades in this district and dealers are cautious in making commitments, feeling that the upward trend will continue. On the other hand, mills are showing more interest in covering for future needs, though they are not showing undue concern over either the price or supply situation.

Southern Pig Iron Price Established by Sales

BIRMINGHAM, April 25. — Pig iron bookings last week were rather light. Most of the Southern foundries now operating covered their early requirements before the advance to $12 on April 15, and a large part of the iron consumption during the second quarter will be under contracts at the former price. A few current sales have been made, and the new price is in force. Shipments have picked up only slightly, and April shipments are not much ahead of the late March rate. Southern foundries, as a rule, are still limited as to operations and their schedules are dependent on current business. Three Birmingham pressure pipe plants received releases last week on about 3300 tons from St. Louis, on which bids were opened two weeks ago. April business of the Birmingham pressure pipe plants is not much ahead of March and prospects for early May do not promise any improvement. Republic Steel Corpn. is planning to resume production of iron about May 1. This company has had a furnace banked since Dec. 31. Only two furnaces have been operating this month, one being on basic and one on foundry.

Steel

Steel bookings are holding to the moderate improvement of recent weeks. The demand is mostly for wire, nails, fencing, sheets and other light products and is coming in small lots from jobbers and the country trade. Buying of plates, shapes and bars is lagging, as it has been for some time. Mill schedules are determined from week to week by the volume of current tonnage. Galvanized sheets have advanced $2 a ton. No other changes have been made in sheets, or in bars, plates and shapes. The Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. operated on a slow schedule three days last week and will run several days this week, making about 3000 tons altogether. Open-hearth operations the past three weeks have been maintained at seven units. This same rate is scheduled for the present week.

Detroit Scrap Prices Rise 25c. to 75c. a Ton

DETROIT, April 25.—Scrap prices continue to soar as steel mill operations increase and a shortage of scrap looms. Many items, including heavy melting steel, are up 25c. to 50c. a ton, while borings and short turnings have advanced 75c.

The local steel plant, now running all six of its open-hearths, is reported to be considering the importation of scrap by water in the next 60 days so as to have a more comfortable backlog.

Cleveland Steel Orders and Operations Gain Further

Volume of Business This Month the Best of the Year Thus Far—Cleveland Ingot Rate Up to 38 Per Cent

CLEVELAND, April 25.—The volume of finished steel business continues to gain, the increased activity being most noticeable in sheets, strip steel and bars. April sales will show a marked gain over those of any previous month this year.

Ingot output in Cleveland has increased three points this week, now being 38 per cent of capacity, which has been equaled only in two previous weeks this year. The Corrigan, McKinney Steel Co. has put on an additional open-hearth furnace and plans to start up two more furnaces late this week. This company has also started up a second blast furnace. The American Steel & Wire Co. at the end of the week will close down the three open-hearth furnaces that it is now operating in Cleveland, as well as its Bessemer converter and blooming mill. Steel for its local finishing mills will be supplied by the Lorain works of the National Tube Co.

Demand for steel from the automotive industry is holding up to recent volume, orders being confined to early requirements. Present production by some of the leading automobile makers is expected to be maintained through May.

Miscellaneous orders for steel from other sources have improved materially. Operations of many consuming plants have been stepped up, stimulating the demand, although some tonnage evidently has been brought out by the talk of price advances. The Erie Railroad expects in a day or two to place track accessories to go with its recent rail purchases.

The price situation is being closely watched by consumers because of advances that may result from inflation. There is talk of an early advance on hot-rolled strip. Pig iron shows a firmer tone and scrap has again sharply advanced.

Pig Iron

Probably because of the strengthening of pig iron prices and the upward movement in scrap, inquiry has again improved. While sales were light during the week, new inquiries aggregating 6000 to 7000 tons came out in lots up to 1000 tons. The iron is wanted for the second and third quarters. While some producers are quoting current prices for the latter period they will not quote for the fourth quarter. April shipments will be nearly double those in March when the banking situation caused hold-ups. Lake furnaces are now generally maintaining $14.50 for foundry and malleable iron for Ohio and Indiana and $15.50 for Michigan. For Cleveland delivery, the price is unchanged at $15, furnace. The Corrigan, McKinney Co. has started up an additional blast furnace, now operating two of its four.

Iron Ore

Ore sellers are encouraged by the turn in the steel market. While no inquiry has come out and there has been little talk of prices, it is expected that last year's prices will be reaffirmed. The Ford Motor Co., which usually is the first to enter the market and buys a large tonnage, has given out the information that it probably will buy no ore this year.

Sheets

Demand made further gains the past week. Considerable tonnage in new specifications came from the motor car industry for early needs, and miscellaneous business increased. Producers generally are not inclined to book orders for extended deliveries except for specific requirements, as they desire to be able to take advantage of any possible price advance. Demand from the refrigerator industry is holding up well. Local mills are comfortably filled for two weeks' operations. The advance to 2.70c. on galvanized sheets has become generally effective.

Strip Steel

Good-sized orders were placed by some of the automotive industries during the week, and mills are being crowded for delivery of this tonnage. Miscellaneous orders are more plentiful. Cold-rolled strip is firmer in that more business is being placed at 1.90c., Cleveland, instead of the 1.80c. minimum. The small-lot price is unchanged at 2c. Hot-rolled strip is firm at 1.45c., Pittsburgh.

Bars, Plates and Shapes

There is a further improvement in the demand for steel bars both from the automotive industry and diversified consumers. Plates are also moving in better volume. A local mill has taken some good orders for locomotive fire box steel and for plates for beer tanks. Some demand has developed from railroads for bars and plates for repair work. Activity in the structural field continues very light. Plates and shapes range from 1.50c. to 1.60c., Pittsburgh. Bars are firm at 1.65c., Cleveland.

Scrap

Prices continue to move upward, quotations on leading steel-making grades and on blast furnace scrap being from 75c. to $1 a ton higher than a week ago. A Cleveland mill Saturday purchased several thousand tons, paying $8.50 for No. 1 heavy melting steel, $6.25 for No. 2 busheling and $6.50 for mixed borings and turnings, or $1 a ton higher than it paid last month. The higher prices are not bringing out much scrap, as owners are holding scrap for further advances.

Scrap Higher, Pig Iron Active at St. Louis

ST. LOUIS, April 25.—Inquiries for pig iron, totaling several thousand tons for lots ranging from 100 to 1000 tons, were received last week by the St. Louis Gas & Coke Co. The inquiries are for shipment not later than June 30 and cover all grades except basic. Some sales are being made, and the prospects are that pending business will develop into sales. The local producer's base price for No. 2 foundry iron is $15.50, Granite City, with a special price of $16.35, delivered St. Louis or Belleville. Alabama makers have made some sales during the week at the new price of $15.85, delivered St. Louis.

Steel

Mississippi Valley Structural Steel Co. has been awarded the contract for the Federal building here, requiring 6600 tons of structural steel; 900 tons of reinforcing bars are still to be awarded. New business resulting from the legalization of beer includes the award of 250 tons of structural steel to the Atlas Iron Works for a new bottling plant, and 125 tons of plates for tanks for the Falstaff Corpn. to the St. Louis Structural Steel Co. The brewing industry also is providing some activity for warehouses. Tie plates are outstanding in steel requirements of railroads, the Missouri Pacific being in the market for 1,490,000 units, weighing approximately 9000 tons, while another road has bought approximately 1000 tons. There is some activity in sheets for license plates, the State of Kansas having purchased 280 tons of this item from the Capitol Iron Works, Topeka, while the State of Oklahoma is in the market for 150 tons for the same purpose. The State of Missouri will open bids on May 5 for 450 tons of maintainer and grader blades for its highway department. Word comes from Oklahoma that the Great Lakes Pipe Line Co. is expected to extend its line to East Chicago, Ind., where terminal facilities will be provided.

Scrap

The scrap market is extremely active. Following the sale of 3000 tons of heavy melting steel and miscellaneous rails to a district melter and advances in the Chicago and Valley markets, prices here advanced 25c. to $1 a ton. The Louisville & Nashville has issued a list of 9000 tons of scrap rail, and the Mobile & Ohio has a list of 25 carloads.

New York Steel Business Shows Gains; Pig Iron Also Better

April Orders for Some Steel Companies Will Be the Best in a Year —Galvanized Sheets Now Firm at 2.70c

NEW YORK, April 25. — Steel business has improved to such an extent that some companies expect to book this month the largest volume they have had in this territory in any month since the spring of 1932. In considerable measure the improvement is due to tin plate specifications, but there have been gains also in orders for other products. Structural shapes, plates, reinforcing bars and pipe, which are dependent on building construction, are in poor demand, but bars, sheets, strip steel, alloy steels and wire products have contributed to the tonnage increases.

Buyers are pressing mills hard for quick deliveries, indicating urgent need of material and depleted inventories. Moreover, orders are being sent in without dickering as to price in many instances.

All makers are now quoting 2.70c. a lb., Pittsburgh, on galvanized sheets, but customers who had not contracted for the second quarter were given an opportunity during the past week to do so, and consequently the 2.70c. price will be given little test before the third quarter. There is talk of higher prices for third quarter on some other products, but no definite moves have been announced.

Pig Iron

The market is more buoyant. Bookings, at 4000 tons, compare with 2500 tons in the previous week. Inquiry is more active. While melt is not increasing, there is a growing desire to get under cover before prices advance. Some of the largest consumers contracted for their requirements several weeks ago. Now smaller users, if their finances permit, are feeling out the market, in some cases attempting to cover through the fourth quarter. Producers are taking business through the third quarter, but are generally reluctant to accept tonnage for more remote delivery. Typical of the change in sentiment is the fact that foundries which hesitated about buying a carload a few weeks ago are now asking for prices on 500-ton lots. Fear of inflation is, of course, the main reason for the change in attitude on the part of buyers. However, it is not the only consideration. The decline in dollar exchange is expected to result in higher prices on foreign irons, although no such advances have yet been reported. Increased activity among steel companies is also a factor. The recent sharp rise in steel output has already caused embarrassment from the point of view of pig iron supply. Idle blast furnaces cannot be put into service overnight and in the meantime stocks of cold metal are being used up rapidly. If steel production continues to expand, temporary shortages of iron may develop from time to time long before the country's blast furnace capacity is fully employed. The opening of the State barge canal has not resulted in any water shipments from Buffalo. Stocks of barge iron in this area have not yet been entirely disposed of. Silicon differentials on Buffalo iron are 25c. a ton, the same figure that was recently adopted by eastern Pennsylvania furnaces. The A. P. Smith Mfg. Co., East Orange, N. J., which was in the market for 200 tons each of No. 2 plain and No. 2X foundry iron, has bought foreign iron.

Scrap

Scrap prices are stronger in the New York district, with higher quotations on some items. The export movement, rather than the rising markets at Pittsburgh and Philadelphia, has brought a higher price range on heavy melting steel. For export shipments, $5.50 is being paid. Scrap dealers believe that the improved domestic demand, coupled with exports, is strengthening scrap prices and not the expectation of inflation.

Construction Work More Active on Coast

SAN FRANCISCO, April 24.— Plans have been completed and bids will be asked in about two months at Pasadena, Cal., for the construction of approximately 20 miles of conduit line from Pipe Canyon Dam. The pipe line will be of welded steel ¼ in. to ⅜ in. thick and from 38 in. to 42 in. in diameter and will weigh approximately 7000 tons. At Los Angeles bids are to be taken soon on the $2,750,000 White Point Outfall sewers which will require 5700 ft. of 60-in. cast-iron pipe. Bonds are to be voted on soon at Alhambra, Cal., for developing the Rio Hondo project, which will require 30,000 ft. of 24-in. cast iron pipe, weighing 3024 tons. Bids have been taken at Los Angeles on the Iron Mountain, Coxcomb and Cottonwood tunnels which are part of the Colorado River project. Contracts for the steel for these three tunnels, totaling 384 tons of structural steel and 270 tons of reinforcing bars, will be awarded separately.

At San Francisco the Pacific Coast Steel Corpn. was awarded the contract for furnishing 2900 tons of reinforcing bars for the anchorages for the Golden Gate bridge. The general contract for the Bohemian Club at San Francisco has been awarded, but the 984 tons of structural steel and 200 tons of bars have not as yet been placed.

No bids have been received at Seattle on the Railway Avenue seawall, which called for 1678 tons of reinforcing bars, 5690 tons of sheet piling and 770 tons of cast iron pipe. No decision has been reached as to what action will be taken.

Although structural awards for the week totaled only 247 tons, and inquiries 1330 tons, feeling in the trade is more buoyant. The week's reinforcing bar lettings aggregated 3125 tons and inquiries 1060 tons. Prices in general are firm, and it is reported that sheets are likely to advance at any time.

Steel Production Higher in Cincinnati Area

CINCINNATI, April 25. — Inflationary moves have strengthened market feeling here and brought out a moderate improvement in demand for pig iron. Bookings, the past week, totaled nearly 1000 tons, of which 500 tons of Northern foundry iron was purchased by a south central Ohio melter. Prices on this order figured about $14.50, base, Cleveland, and indicate that Northern furnaces are adhering to present schedules. The Southern iron market is unaffected by new quotations, which figure about 50c. under competing Northern furnace prices. Current business of Southern furnace representatives is small and in less than 100-ton lots. A small increase in the automotive melt is reported, but general foundry operations are low. Inquiry is nil. Consumers' attempts to obtain price protection for third quarter are unavailing, since furnaces insist on specific tonnages before guaranteeing prices.

Coke

Lower prices on domestic coke with the differentials on nut and egg sizes waived have failed to stimulate more than a seasonal demand. Foundry grades are not in active demand, although shipments, particularly to automotive foundries, are improving.

Steel

Production of district mills is nearing 40 per cent of capacity, with a moderate improvement in automotive specifications and a slight expansion of refrigerator demand. Galvanized sheets are not reacting to the usual seasonal stimulus, following price increases to 2.70c., base, Pittsburgh, or 2.98½c., in carload lots delivered in Cincinnati. Other quotations are firm.

Scrap

Advances of 25c. a ton on heavy melting steel and a few other scrap items have been ineffective in melting the frozen sources of supply.

Fabricated Structural Steel

Awards Higher—New Projects Also in Better Volume

LETTINGS of 12,350 tons are highest since the first week in April and show a considerable gain over last week's total of 4200 tons. More than one-half of the tonnage reported is for a Federal building in St. Louis. New projects call for 11,550 tons, compared with 3150 tons a week ago. The outstanding inquiry is for an apartment building in New York for the Fred. F. French Investing Co., Inc., which will require 7400 tons. Awards follow:

NORTH ATLANTIC STATES

Chestnut Hill, Mass., 100 tons, bridge, to Lackawanna Steel Construction Co.

Brooklyn, 365 tons, Jewish Home for Incurables, to Montgomery Iron & Steel Co., Philadelphia.

Jersey City, N. J., 105 tons, alterations to boiler house for Delaware, Lackawanna & Western Railroad, to American Bridge Co.

Schenectady, N. Y., 100 tons, substation for New York Power & Light Corpn., to Lehigh Structural Steel Co.

Philadelphia, 530 tons, addition to packing house of J. J. Felin & Sons, to McClintic-Marshall Corpn.

Camden, N. J., 140 tons, addition to Kieckhefer Container plant, to McClintic-Marshall Corpn.

Susquehanna, Pa., 475 tons, State highway bridge, to Jones & Laughlin Steel Corpn.

Baltimore, 130 tons, alterations to Charles Street bridge, to Acme Steel Co., Baltimore.

Baltimore, 160 tons, garage for Rice Baking Co., to Dietrich Brothers Co., Baltimore.

SOUTH AND SOUTHWEST

Louisville & Nashville Railroad, 925 tons, bridges; 505 tons to Mount Vernon Bridge Co., Mount Vernon, Ohio, and 420 tons to Ingalls Iron Works Co., Birmingham.

Fort Worth, Tex., 1250 tons, Federal Building, to Austin Brothers, Dallas, Tex.

New Orleans, 175 tons, beams for cofferdam to be built by Siems-Helmers, Inc., to American Bridge Co.

CENTRAL STATES

Chicago, 200 tons, press building, to Worden-Allen Co., Milwaukee.

Jasper County, Iowa, 150 tons, bridge, to Pittsburgh-Des Moines Steel Co.

State of South Dakota, 110 tons, beam bridge, to Minneapolis-Moline Power Implement Co.

St. Louis, 6600 tons, Federal building, to Mississippi Valley Structural Steel Co., St. Louis.

St. Louis, 250 tons, bottling plant for Falstaff Brewing Corpn., to Atlas Iron Works and Superior Structural Steel Co., both of St. Louis.

WESTERN STATES

State of Colorado, 247 tons, highway structures at Las Animas and Huerfano, to unnamed bidders.

Midvale, Utah, 235 tons, lead refinery for United States Smelting, Refining & Mining Co., to Minneapolis-Moline Power & Implement Co.

Arcadia, Cal., 100 tons, bridge for Santa Fe Railroad, to American Bridge Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 7400 tons, Knickerbocker apartment building for Fred F. French Investing Co., Inc.

Brooklyn, 200 tons, building for W. M. Evans Dairy Co.

Elizabeth, N. J., 230 tons, building for Wilson-Jones Mfg. Co.

Villanova, Pa., 350 tons, Augustinian Monastery for Villanova College.

Washington, 500 tons, building for Howard University.

SOUTH AND SOUTHWEST

Durham, N. C., 125 tons, residence for St. Pierre Du Bose.

Phoenix, Ariz., 900 tons, post office; bids having exceeded appropriation, new bids will be taken later.

CENTRAL STATES

State of Indiana, 700 tons, highway bridges.

Decatur, Ill., 275 tons, crossing for Wabash Railroad.

WESTERN STATES

San Francisco, 984 tons, Bohemian club; Dinwiddie Construction Co., general contractor.

Pasadena, Cal., 350 tons, three spillway gates for Pine Canyon Dam; bids to be taken in two months.

Glendale, Cal., 125 tons, columns for Chevy Chase reservoir; Steel Form Construction Co. and George H. Wray, low bidders.

Los Angeles, 1285 tons, Glendale Boulevard viaduct.

FABRICATED PLATE

AWARDS

Fort Mifflin, Pa., 125 tons, for 20-in. steel pipe, to Lancaster Iron Works, Lancaster, Pa.

St. Louis, 125 tons, tanks for Falstaff Brewing Corpn., to St. Louis Structural Steel Co., East St. Louis, Ill.

NEW PROJECTS

Los Angeles, 150 tons, three steel tanks for Metropolitan Water District; bids under advisement.

Pasadena, Cal., 7000 tons, 20 miles of 38- to 42-in. pipe from Pine Canyon Dam.

Buffalo Steel Output Continues to Rise

BUFFALO, April 22—Recent developments at Washington have stimulated the local pig iron market, bringing out both orders and inquiries. Inquiries are ranging from 100 tons to 1000 tons, with melters apparently anxious to contract for future delivery. It is believed that at least 5000 to 6000 tons has been sold during the past week and possibly more.

Steel

Republic Steel Corpn. on Sunday charged its fourth open-hearth furnace, increasing its operation by one. The Lackawanna plant of the Bethlehem Steel Corpn. continues to operate five open-hearths, and the Wickwire-Spencer Corpn. one. The Seneca sheet division of the Bethlehem company is operating at 25 per cent. It was erroneously reported last week that the State Armory at Binghamton would be rebid. This reference should have been to the Binghamton post office project.

Scrap

Between 2000 and 2500 tons of No. 2 heavy melting scrap was purchased last week by a Buffalo mill at a reported price of $7.25. It has just been learned that an order was placed for Youngstown delivery approximately two weeks ago for 2000 tons of No. 2 heavy melting steel at a price reputed to be $5.25, Buffalo. The firm, which negotiated the $7.25 sale, is now paying $6.50 to $6.75 to complete the order. This transaction has resulted in the Buffalo market becoming exceptionally strong in all grades of material. With increased strength reported from Youngstown and Pittsburgh, supplies of scrap which ordinarily come into this district are drying up, and dealers are unwilling to sell what they have. Sales of No. 1 machinery cast scrap are reported at $10. Sales of No. 1 cupola cast are reported at $9 to $9.50. Three-foot rails have been sold at $10, railroad malleable at $8 to $9 and scrap rails at $6.50 to $7.

Reinforcing Steel

Awards 3400 Tons—New Projects, 860 Tons

State of Kentucky, 400 tons, State highway work in Tremble and Carroll counties, to Jones & Laughlin Steel Corpn., through Southeastern Construction Co., Eminence, Ky., general contractor.

San Francisco, 2900 tons, Golden Gate bridge anchorages, to Pacific Coast Steel Corpn.

Inglewood, Cal., 100 tons, mausoleum, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Pasadena, Cal., 500 tons, Pine Canyon Dam; Blue Diamond Corpn., low bidder.

Los Angeles County, Cal., 260 tons, San Gabriel Dam No. 1 outlet tunnel; bids May 1.

San Francisco, 200 tons, Bohemian Club; Dinwiddie Construction Co. general contractor.

Los Angeles, 100 tons, city work, bids under advisement.

Panama Canal Zone, 300 tons, Schedule 2860, classes 1 and 2; bids May 2.

Railroad Equipment

Wilson Car Line will build 50 refrigerator cars in its own shops in Chicago.

Interstate Railroad, Philadelphia, is negotiating with Central Supply Co., Inc., Philadelphia, for repair of 50 hopper and 50 gondola cars.

American Refrigerator Transit Co., which is owned jointly by the Mississippi and the Wabash, will reconstruct and repair 1300 refrigerator cars at a cost of about $1,500,000. Bulk of work will be done in company shops at St. Louis, remainder to be placed in shops at Kansas City and Pueblo, Colo. Orders for 500 integral type cast steel side frames are reported to have been divided equally between Scullin Steel Co. and American Steel Foundries.

Metropolitan Water District of Southern California has awarded contract for 12 8-ton electric storage battery locomotives to Whitcomb Locomotive Co., Rochelle, Ill., a subsidiary of Baldwin Locomotive Works. These locomotives will be used in building Coachella tunnels in California. Tunnels are about 33 miles long and are to be a part of Metropolitan aqueduct system financed through Reconstruction Finance Corpn.

Non-Ferrous Metal Prices Higher on Heavy Sales

Tin Bookings at 300 Tons a Day; Zinc Buying Very Large—Copper and Lead Active

NEW YORK, April 25.—As a result of the Administration's proposals for "controlled inflation" of the country's currency, prices of all metals have advanced sharply, followed by active buying. Price levels are now the highest in many months.

Copper

Immediate reaction to the Washington proposals was an advance in the price of electrolytic copper which has been firmly maintained. For delivery through June electrolytic copper is quoted at 6.25c. a lb., delivered Connecticut, or 6c., refinery. Sales have been heavy but not as large as for other metals. Consumers have been the principal buyers, though some speculators have been active. Early last week the market was exceedingly active, but today it is quieter but very firm. Some primary producers are asking 6.50c. delivered but very little has changed hands at this level. The 6.25c. delivered price is the highest since Oct. 20, 1932. Lake copper is quoted at 6.25c., delivered New York. Serious consideration is still being given to plans for a complete shutdown of the American industry. It is pointed out that, with stocks of about 600,000 net tons of refined metal above ground, a stoppage of operations for seven or eight months would not be unwise even if demand continues intensive. In the foreign market prices have fluctuated considerably due to the gyrations of exchange. The highest level at which business has been done has been 6.30c. a lb., delivered European ports. Today, however, demand is less insistent at 6.12½c. Heavy buying is reported, participated in by both American and foreign producers.

Tin

Daily advancing prices for spot Straits tin during the week have brought the quotation today to 30.25c a lb., New York. This level has not been reached since Aug. 5, 1930. Accompanying these advances have been heavy sales, averaging about 100 tons each day. This is the most intense buying wave in many months. The demand has been mostly nearby, involving spot, May and June, and largely from consumers. In London there has also been a rush to buy, owing to sharp advances in sterling, with bookings reported as "tremendous." Quotations have also been lifted there by some £8 a ton. Today spot standard stood at £162 17s 6d, future standard at £163 10s and spot Straits at £171 7s 6d. The Singapore price today was £171 17s 6d, up £6 a ton for the week. Statistically the market is regarded as in good condition, with shipments from the Straits at 3629 tons to April 24 and with the month's total put at about 4200 tons. This is expected to result in a decrease of about 2400 tons in the world's visible supply.

Lead

Prices for lead rose at once, following announcements of the Washington news, and buying for two days was very heavy. So much so that consumers' needs for April and May are regarded as covered with some small consignments apportioned for June. Today the market is very quiet, but exceedingly firm at 3.37½c. St. Louis, or 3.50c. a lb., New York, which is the highest quotation since Sept. 20, 1932.

Zinc

This has been a very active market, with sales for the week ended Saturday, April 22, estimated at 9000 tons, the largest total since January, 1930. Prices also suddenly skyrocketed to 3.70c. a lb., East St. Louis, or 4.07c., New York, where they remain today with demand considerably less. These are the highest levels since September, 1931. The large business was represented by sales anywhere from 3.50c to 3.75c. a lb. East St. Louis. Some producers today will not sell under 3.75c. or higher. Most of the demand came from consumers whose stocks are by no means large. Ore prices also were elevated. On Saturday in the Joplin district, the quotation advanced about $4 a ton to $24 a ton with sales exceeding production. Stocks at the end of the week were estimated at 17,300 tons.

R-S Products Corpn., Germantown Avenue at Wayne Junction, Philadelphia, has executed an agreement with Ryan, Scully & Co., Philadelphia, whereby all products of the latter concern will be manufactured, sold and installed by R-S Products Corpn. F. J. Ryan, president, and G. F. Beach, chief engineer, of Ryan, Scully & Co., are associated in like positions with the R-S Products Corpn., which has taken over the leasehold of the property at 4500 Germantown Avenue, Philadelphia, previously controlled by Ryan, Scully & Co.

The Week's Prices. Cents Per Pound for Early Delivery

	April 19	April 20	April 21	April 22	April 24	April 25
Electrolytic copper, N. Y.*	5.25	5.75	6.00	6.00	6.00	6.00
Lake copper, New York	5.50	6.00	6.25	6.25	6.25	6.25
Straits tin, Spot, N. Y.	28.00	29.50	29.37½	....	30.00	30.25
Zinc, East St. Louis	3.30	3.70	3.70	3.70	3.70	3.70
Zinc, New York	4.07	4.07	4.07	4.07	4.07	4.07
Lead, St. Louis	3.12½	3.37½	3.37½	3.37½	3.37½	3.37½
Lead, New York	3.50	3.50	3.50	3.50	3.50	3.50

*Refinery quotations price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.12½c. a lb., New York.
Brass ingots, 85-5-5-5, 6.50c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	32.00c. to 33.00c.
Tin, bar	34.00c. to 35.00c.
Copper, Lake	7.50c. to 8.25c.
Copper, electrolytic	7.25c. to 7.50c.
Copper, castings	7.00c. to 8.00c.
*Copper sheets, hot-rolled	13.87½c.
*High brass sheets	11.75c.
*Seamless brass tubes	13.50c.
*Seamless copper tubes	12.62½c.
*Brass rods	9.25c.
Zinc, slabs	5.00c. to 5.50c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	4.25c. to 5.25c.
Lead, bar	5.75c. to 6.75c.
Lead, sheets	7.25c.
Antimony, Asiatic	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	16.00c.
Solder, ½ and ½	20.00c. to 21.00c.
Babbitt metal commercial grade	21.00c. to 32.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	33.75c.
Tin, bar	35.75c.
Copper, Lake	7.25c.
Copper, electrolytic	7.25c.
Copper, casting	7.00c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	4.25c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	8.50c.
Babbitt metal, medium grade	17.00c.
Babbitt metal, high grade	38.00c.
Solder, ½ and ½	19.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	4.125c.	4.75c.
Copper, hvy. and wire	3.875c.	4.625c.
Copper, light and bottoms	3.00c.	3.75c.
Brass, heavy	2.25c.	2.50c.
Brass, light	1.625c.	1.875c.
Hvy. machine composition	2.875c.	3.25c.
No. 1 yel. brass turnings	2.50c.	2.75c.
No. 1 red brass or compos. turnings	2.625c.	2.875c.
Lead, heavy	2.375c.	2.75c.
Zinc	1.25c.	1.75c.
Cast aluminum	3.75c.	5.00c.
Sheet aluminum	8.50c.	10.00c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.98c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.i.f. Pacific ports	2.10c.

Billet Steel Reinforcing
(as quoted by distributors)

F.o.b. P'gh mills, 40, 50, 60-ft.	1.40c.
F.o.b. Birmingham, mill lengths	1.65c.
F.o.b. Cleveland	1.40c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c.
F.o.b. Chicago Heights mills	1.50c.

Iron

Common iron, . . . Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.86c.
Common iron, del'd New York	1.90c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.50c. to 1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.7035c. to 1.8035c.
Del'd Philadelphia	1.4935c. to 1.5935c.
F.o.b. Coatesville	1.40c. to 1.50c.
F.o.b. Sparrows Point	1.40c. to 1.50c.
Del'd New York	1.598c. to 1.698c.
C.i.f. Pacific ports	2.00c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.7035c. to 1.8035c.
Del'd Philadelphia	1.7495c.
Del'd New York	1.86775c.
C.i.f. Pacific ports (standard)	2.10c.
C.i.f. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2000 (1/2% Nickel)	$0.25
2100 (1 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	2.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and Square	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 3/4c. a lb. higher, with standard classification for cold-finish alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh Mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.90c.
Bars, eastern Michigan	1.95c.
Shafting, ground, f.o.b. mill, 1 1/4 in.	2.00c.
1-3/16 to 1 1/2 in.	2.50c.
1-9/16 to 1 7/8 in.	2.35c.
1-15/16 to 2 3/8 in.	2.20c.
2-15/16 to 6 in.	2.05c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot-Rolled

No. 10, f.o.b. Pittsburgh	1.40c.
No. 10, f.o.b. Chicago mill	1.50c.
No. 10, del'd Philadelphia	1.71c.
No. 10, f.o.b. Birmingham	1.55c.
No. 10, c.i.f. Pacific Coast ports	2.02 1/2c.

Hot-Rolled Annealed

No. 10, Pittsburgh	1.55c.
No. 10, Chicago mills	1.65c.
No. 10, Birmingham	1.70c.
No. 10, Pacific Coast ports	2.17 1/2c.
No. 10, wrought iron, Pittsburgh	3.60c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.00c.
No. 24, f.o.b. Chicago mills	2.10c.
No. 24, del'd Philadelphia	2.31c.
No. 24, f.o.b. Birmingham	2.15c.
No. 24, c.i.f. Pacific Coast ports	2.65c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	1.90c.
No. 10 gage, f.o.b. Chicago mills	2.00c.
No. 10 gage, del'd Philadelphia	2.21c.
No. 10 gage, del'd Pacific Coast ports	2.52 1/2c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.30c.
No. 20 gage, f.o.b. Chicago mills	2.40c.
No. 20 gage, del'd Philadelphia	2.61c.
No. 20 gage, del'd Pacific Coast ports,	2.95c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.70c.
No. 24, f.o.b. Chicago mills	2.80c.
No. 24, del'd Philadelphia	3.01c.
No. 24, f.o.b. Birmingham	2.85c.
No. 24, c.i.f. Pacific Coast ports	3.25c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh	2.75c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.30c.
No. 28, Chicago mill	2.40c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$8.70
15-lb. coating I.C.	11.00
20-lb. coating I.C.	11.90
25-lb. coating I.C.	13.00
30-lb. coating I.C.	13.80
40-lb. coating I.C.	15.30

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.45c.
All widths up to 24 in., Chicago	1.55c.
Cooperage stock, P'gh	1.50c. to 1.55c.
Cooperage stock, Chicago	1.60c. to 1.65c.

Cold-Rolled Strips

F.o.b. Pittsburgh	1.80c. to 2.00c.
F.o.b. Cleveland	1.80c. to 2.00c.
Del'd Chicago	2.20c. to 2.30c.
F.o.b. Worcester	2.00c. to 2.10c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	2.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

Extras of 10c. a 100 lb. on mixed and joint carloads, 20c. on pool carloads and 30c. on less than carloads are applied on all merchant wire products. In carloads and mixed carloads a discount of 10 per cent on extras is allowed.

To Manufacturing Trade

Bright wire	2.10c.
Spring wire	3.10c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.85
Smooth coated nails	1.85
Galvanized nails	2.35
	Base per 100 Lb.
Smooth annealed wire	$2.25
Smooth galvanized wire	2.60
Polished staples	2.55
Galvanized staples	2.80
Barbed wire, galvanized	2.35
Woven wire fence No. 9 gage, base column, per net ton	$50.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
1/8	55	33	1/8	+91 1/2	+138
1/4 to 3/8	60 1/2	42	1/4 & 3/8	+1 1/2	+21 1/2
1/2	65 1/2	54	1/2	31 1/2	15
3/4	69	59	3/4	36 1/2	20 1/2
1 to 3	71	62	1 & 1 1/4	39 1/2	25 1/2
			1 1/2	43 1/2	28
			2	41 1/2	26

Lap Weld

2	66	57	2	37	22 1/2
2 1/2 to 6	69 1/2	60 1/2	2 1/2 to 3 1/2	38	25
7 and 8	68	58	4 to 8	40	28 1/2
9 and 10	67	57	9 to 12	38	24 1/2
11 and 12	66	56			

Butt Weld, extra strong, plain ends

1/8	52	37	1/8	+13	+45 1/2
1/4 to 3/8	55	45	1/4 & 3/8	+2 1/2	+34 1/2
1/2	61 1/2	54 1/2	1/2	22 1/2	17 1/2
3/4	68	59	3/4	37 1/2	22 1/2
1 to 3	70	62	1 to 2	43 1/2	29

Lap Weld, extra strong, plain ends

2	65	57	2	40	26
2 1/2 to 6	69	61	2 1/2 to 4.45	1/2	33
7 to 8	68	58	4 1/2 to 6.45		32 1/2
9 and 10	67	57	7 & 8	46	33
11 and 12	66	56	9 to 12.41	1/2	30

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel

2 in. and 2 1/4 in.	38
2 1/2 in.—2 3/4 in.	46
3 in.	52
3 1/4 in.—4 1/2 in.	54
4 in.	57
4 1/2 in. to 6 in.	46

Charcoal Iron

1 1/2 in.	1
1 3/4 in.	8
2 in.—2 1/4 in.	13
2 1/2 in.—2 3/4 in.	16
3 in.	17
3 1/4 in. to 3 1/2 in.	18
4 in.	20
4 1/2 in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn

1 in.	61	3 in.	48
1 1/4 to 1 1/2 in.	53	3 1/4 to 3 1/2 in.	48
1 3/4 in.	37	4 in.	51
2 to 2 1/4 in.	32	4 1/2, 5 and 6 in.	40
2 1/2 to 2 3/4 in.	40		

Hot Rolled

2 and 2 1/4 in.	38	3 1/4 to 3 1/2 in.	54
2 1/2 and 2 3/4 in.	46	4 in.	57
3 in.	52	4 1/2, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$40.00
Light (from billets), f.o.b. mill	30.00
Light (from rail steel, f.o.b. mill)	26.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.15
Spikes, 1/2-in. and larger	2.30
Spikes, boat and barge	2.60
Tie plates, steel	1.75
Angle bars	2.55
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, (per 100 count)	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	75
Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.c. and t. square or hex nuts, blank or tapped	75

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh	75, 25 and 10
Stove bolts in packages, Ch'go	75, 25 and 10
Stove bolts in pkgs., Cleveland	75, 25 and 10
Stove bolts in bulk, P'gh	86
Stove bolts in bulk, Chicago	86
Stove bolts in bulk, Cleveland	86
Tire bolts	60 and 10

Discounts of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

(1/2-in. and larger)

	Base per Lb.
F.o.b. Pittsburgh or Cleveland	$3.25
F.o.b. Chicago	3.35

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 10
F.o.b. Cleveland	70, 10 and 10
F.o.b. Chicago	70, 10 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	85
Milled standard set screws, case hardened, 1 in. dia. and smaller	80
Milled headless set screws, cut thread 5/8 in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85 and 10
Upset set screws, sq. head	80
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. to 6-in., inclusive Pittsburgh	$26.00
Rerolling, 4-in. to 6-in., inclusive Youngstown	26.00
Rerolling, 4-in. to 6-in., inclusive Cleveland	26.00
Rerolling, 4-in. to 6-in., inclusive Chicago	26.00
Forging quality, Pittsburgh	$1.00
Forging quality, Youngstown	$1.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Slabs

(3 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

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Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$1.75 to $2.00
Foundry, f.o.b. Connellsville Prompt	2.50 to 4.00
Foundry, by-product, Chicago ovens, for delivery outside switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	8.50
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.00 to $1.15
Mine run coking coal, f.o.b. W. Pa.	1.10 to 1.25
Gas coal, ¾-in., f.o.b. Pa. mines	1.25 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.20 to 1.30
Steam slack, f.o.b. W. Pa. mines	0.25 to 0.35
Gas slack, f.o.b. W. Pa. mines	0.35 to 0.45

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.25c
No. 5 industrial fuel oil	2.65c. to 2.75c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.00c.
No. 4 industrial	4.50c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Penn.	$35.00	$30.00
Maryland	35.00	30.00
New Jer.	$44.00 to 57.00	
Ohio	35.00	30.00
Kentucky	35.00	30.00
Missouri	35.00	30.00
Illinois	35.00	30.00
Ground fire clay, per ton	6.50	

Chrome Brick

	Per Net Ton
Standard size	$42.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$61.50
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.90

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$41.40
4-in., del'd Chicago	44.40
6-in., and larger, del'd New York	35.30
4-in., del'l New York	38.30
6-in., and larger, Birm'ham	33.00
4-in., Birmingham	36.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per Gross ton, f.o.b. Valley furnace:

Basic	$13.50 to $14.00
Bessemer	15.00
Gray Forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	14.50
Low phos., copper free	23.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per Gross ton, f.o.b. Pittsburgh district furnace:

Basic	$14.00 to $14.50
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.50

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnaces:

N'th'n No. 2 fdy.	$15.50
N'th'n No. 1 fdy.	16.00
Malleable, not over 2.26 sil.	15.50
High phosphorus	15.50
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	$16.14 to 17.14
Low. phos., sil. 1 to 2. Copper free	25.00
Silvery, sil. 8 per cent	23.67
Bess. ferrosil'n, 15 per cent	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorous and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$15.50
Del'd St. Louis	16.35
Malleable, f.o.b. Granite City	16.50
Northern No. 2 fdy., del'd St. Louis	17.80
Northern malleable del'd	17.80
Northern basic, del'd	17.80
Southern fdy., sil. 1.75 to 2.25 del'd St. Louis	15.85

Freight rates 83c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per Gross ton, delivered New York district:

*Buffalo, No. 2, del'd east N. J.	$17.41
Buffalo malleable, del'd Eastern N. J.	17.91
East Pa. No. 2 fdy.	15.02
East Pa. No. 2X fdy.	15.27

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy.	$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$15.82
Ala. fdy., sil. 2.25 to 2.75	16.07
Tenn. fdy., sil. 1.75 to 2.25	15.82
N'th'n No. 2 foundry	17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy. (local delivery)	$15.00
Malleable (local delivery)	15.00
Ohio silvery, 8 per cent	21.75
Stand. low. phos., Valley	23.00
Southern No. 2 fdy.	$16.14 to 17.14

Prices are f.o.b furnace except on Southern foundry and silvery iron. Freight rates; 63c. average local switching charge; $3.00 from Jackson, Ohio; $6.14 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2	$14.34
East. Pa. No. 2X	14.59
East. Pa. No. 1X	14.84
Basic (del'd east. Pa.)	14.09
Malleable	15.34
Stand. low phos. (f.o.b. east. Pa. furnace)	20.00 to 21.00
Cop. b'r'g' low phos. (f.o.b. furnace)	20.00 to 21.00
Va. No. 2	21.79
Va. No. 2X	22.29

Prices, except as specified otherwise, are delv'd Philadelphia. Freight rates: 84c. to $1.79 from eastern Pennsylvania furnaces; $4.67 from Virginia furnaces.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00
No. 2 soft, 2.25 to 2.75 sil.	12.50
Basic	12.00

NEW ENGLAND

Per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.05
*Buffalo, sil. 2.25 to 2.75	19.30
†Buffalo, sil. 1.75 to 2.25	18.03
†Buffalo, sil. 2.25 to 2.75	18.28
†Ala., sil. 1.75 to 2.25	$15.64 to 16.64
†Ala., sil. 2.25 to 2.75	16.14 to 16.89

Freight rates: $5.05 all rail from Buffalo, and $3.66 to $4.03 rail and water from Buffalo when $1.25 barge and $2.13 to New England freight rate are obtainable; $5.64 rail and water from Alabama to New England seaboard.

* All-rail rate.

† Rail-and-water rate.

CANADA

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.75	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	23.00 to 23.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	*$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	61.00

*Contract price; spot quotation $61.

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$24.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$19.00	14%	$21.00
11%	19.50	15%	21.50
12%	20.00	16%	22.00
13%	20.50		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$17.00	12%	$20.00
7%	17.50	13%	20.50
8%	18.00	14%	21.00
9%	18.50	15%	21.50
10%	19.00	16%	22.00
11%	19.50		

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	94c.
Ferrotungsten, less carloads	$1.00
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrochromium, 2% carbon	16.50c to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained Va.	$2.60 to $2.80
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	86c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.5% iron	$4.30
Old range, non-Bessemer, 51.50% iron	4.05
Mesabi Bessemer, 51.50% iron	4.05
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorous, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68½% iron	9c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	9c.
Manganese, Caucasian, washed 52%	*28c.
Manganese, African, Indian, 50-52%	*21c. to 22c.
Manganese, Brazilian, 46 to 48%	*13c.
	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid	$10.00
	Per Gross Ton
Tungsten, domestic scheelite	$8.00 to $10.00
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel 85-5, f.o.b. Kentucky and Illinois mines	$10.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$11.00 to 11.50
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	$16.00 to 16.75
Domestic, No. 1 ground bulk, 85 to 98% calcium, fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$10.25 to $10.75
No. 2 heavy melting steel	8.75 to 9.25
No. 2 railroad wrought	10.50 to 11.00
Scrap rails	10.50 to 11.00
Rails 3 ft. and under	11.50 to 12.00
Sheet bar crops, ordinary	10.50 to 11.00
Compressed sheet steel	10.00 to 10.50
Hand bundled sheet steel	9.00 to 9.50
Hvy. steel axle turnings	8.50 to 9.00
Machine Shop turnings	7.25 to 7.75
Short shov. steel turnings	7.25 to 7.75
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	9.00 to 9.50
Heavy breakable cast	8.50 to 9.00
No. 1 cast	9.00 to 10.00
Railr. knuckles and couplers	11.00 to 11.50
Rail, coil and leaf springs	11.00 to 11.50
Rolled steel wheels	11.00 to 11.50
Low. phos. billet corps	11.50 to 12.00
Low. phos. sheet bar crops	11.50 to 12.00
Low. phos. plate scrap	11.00 to 11.50
Low. phos. punchings	11.00 to 11.50
Steel car axles	11.50 to 12.00

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$7.50 to $8.00
Shoveling steel	7.50 to 8.00
Hydraulic comp. sheets	$6.25 to $6.75
Drop forge flashings	5.25 to 5.75
No. 1 busheling	5.75 to 6.25
Rolled carwheels	8.50 to 9.00
Railroad tires	8.50 to 9.00
Railroad leaf springs	9.00 to 9.50
Axle turnings	6.00 to 6.50
Steel couplers and knuckles	8.50 to 9.00
Coil springs	9.00 to 9.50
Axle turnings (elec. fur.)	6.50 to 7.00
Low phos. punchings	9.50 to 10.00
Low phos. plates, 12 in. and under	9.50 to 10.00
Cast iron borings	5.00 to 5.50
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	3.50 to 4.00
Rerolling rails	9.00 to 9.50
Steel rails, less than 3 ft.	9.00 to 9.50
Steel rails, less than 2 ft.	9.00 to 9.50
Angle bars, steel	8.50 to 9.00
Cast iron carwheels	8.25 to 8.75
Railroad malleable	8.00 to 8.50
Agricultural malleable	5.00 to 5.50

	Per Net Ton
Iron car axles	$11.00 to $11.50
Steel car axles	10.00 to 10.50
No. 1 railroad wrought	6.00 to 6.50
No. 2 railroad wrought	6.50 to 7.00

No. 2 busheling	$2.00 to $2.50
Locomotive tires, smooth	7.50 to 8.50
Pipe and flues	1.25 to 1.75
No. 1 machinery cast	8.00 to 8.50
Clean automobile cast	7.00 to 7.50
No. 1 railroad cast	7.50 to 8.00
No. 1 agricultural cast	6.50 to 7.00
Stove plate	6.75 to 7.25
Grate bars	7.00 to 7.50
Brake shoes	

* Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$8.00 to $8.50
No. 2 heavy melting steel	6.00 to 6.50
No. 1 railroad wrought	7.50 to 8.00
Bundled sheets	4.00 to 4.50
Hydraulic compressed, new	5.50 to 6.00
Hydraulic compressed, old	4.00 to 4.50
Machine shop turnings	3.50 to 4.00
Heavy axle turnings	5.50 to 6.00
Cast borings	3.50 to 3.75
Heavy breakable cast	8.50
Stove plate (steel works)	6.00
No. 1 low phos. heavy	10.00 to 10.50
Couplers and knuckles	9.00 to 9.50
Rolled steel wheels	9.00 to 9.50
No. 1 blast furnace	3.50 to 3.75
Spec. iron and steel pipe	6.50 to 7.00
Shafting	12.00 to 13.00
Steel axles	12.00 to 13.00
No. 1 forge fire	5.50 to 6.00
Cast iron carwheels	9.00
No. 1 cast	8.00 to 9.00
Cast borings (chem.)	8.00 to 10.00
Steel rails for rolling	9.00 to 9.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$8.00 to $8.25
No. 2 heavy melting steel	7.50 to 7.75
Compressed sheet steel	7.50 to 7.75
Light bundled sheet stampings	5.00 to 5.50
Drop forge flashings	6.25 to 6.75
Machine shop turnings	4.25 to 4.75
Short shoveling turnings	5.00 to 5.50
No. 1 busheling	6.50 to 7.00
Steel axle turnings	5.00 to 5.50
Low phos., billet crops	10.00 to 11.00
Cast iron borings	5.75 to 6.00
Mixed borings and short turnings	5.75 to 6.00
No. 2 busheling	5.75 to 6.00
No. 1 cast	7.50 to 8.00
Railroad grate bars	5.00 to 5.50
Stove plate	5.00 to 5.50
Rails under 3 ft.	8.50 to 9.00
Rails for rolling	10.00 to 10.50
Railroad malleable	6.75 to 7.00
Cast iron carwheels	8.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$8.25 to $8.75
No. 2 heavy melting scrap	7.00 to 7.50
Scrap rails	7.00 to 7.50
New hylraul. comp. sheets	6.50 to 7.00
Old hydraul. comp. sheets	5.00
Drop forge flashings	6.50 to 7.00
No. 1 busheling	7.00 to 7.50
Hvy. steel axle turnings	6.00
Machine shop turnings	4.00 to 4.50
Knuckles and couplers	9.00
Coil and leaf springs	9.00
Rolled steel wheels	9.00
Low phos. billet crops	9.50 to 10.00
Short shov. steel turnings	5.50 to 6.00
Short mixed borings and turnings	3.75 to 4.25
Cast iron borings	3.75 to 4.25
No. 2 busheling	3.50 to 4.00
Steel car axles	10.00 to 11.00
Iron axles	10.00 to 11.00
No. 1 machinery cast	9.50 to 10.00
No. 1 cupola cast	9.00 to 9.50
Stove plate	7.00 to 7.50
Steel rails, 3 ft. and under	10.00 to 10.50
Cast iron carwheels	8.00 to 9.00
Industrial malleable	7.00 to 7.50
Railroad malleable	8.00 to 8.50
Chemical borings	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$7.00 to $7.50
Scrap steel rails	7.00 to 7.50
Short shoveling turnings	4.00
Stove plate	6.00
Steel axles	9.00
Iron axles	9.00
No. 1 railroad wrought	4.50 to 5.00
Rails for rolling	7.50 to 8.00
No. 1 cast	8.00 to 8.50
Tramcar wheels	8.00
Cast iron borings, chem.	3.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$6.00 to $6.50
No. 1 heavy melting	5.50 to 6.00
No. 2 heavy melting	5.00 to 5.50
No. 1 locomotive tires	5.00 to 5.50
Misc. stand-sec. rails	6.50 to 7.00
Railroad springs	7.25 to 7.75
Bundled sheets	2.00 to 2.50
No. 2 railroad wrought	5.50 to 6.00
No. 1 busheling	3.50 to 4.00
Cast iron borings and shoveling turnings	1.25 to 1.75
Rails for rolling	7.50 to 8.00
Machine shop turnings	1.25 to 1.75
Heavy turnings	3.00 to 3.50
Steel car axles	8.50 to 9.00
Iron car axles	11.00 to 11.50
Wrot. iron bars and trans.	4.00 to 4.50
No. 1 railroad wrought	3.50 to 4.00
Steel rails less than 3 ft.	8.00 to 8.50
Steel angle bars	6.50 to 7.00
Cast iron carwheels	5.50 to 6.00
No. 1 machinery cast	7.00 to 7.50
Railroad malleable	5.50 to 6.00
No. 1 railroad cast	6.25 to 6.75
Stove plate	6.50 to 7.00
Relay. rails, 60 lb. and under	16.00 to 16.50
Relay. rails, 10 lb. and over	$20.00 to $21.00
Agricult. malleable	4.00 to 4.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$4.00 to $4.25
Scrap T rails	3.75 to 4.00
Machine shop turnings	1.00 to 1.50
Cast iron borings	1.05
Bundled skeleton, long	2.10 to 2.25
Forge flashings	2.50 to 3.00
Blast furnace scrap	0.90 to 1.00
Forge scrap	3.00 to 3.25
Shafting	6.25 to 6.50
Steel car axles	9.00 to 9.50
Wrought pipe	4.00 to 4.25
Rails for rolling	4.50 to 5.00
Cast iron borings, chemical	7.00 to 7.25
Per gross ton delivered consumers' yards:	
Textile cast	$7.00 to $7.50
No. 1 machinery cast	7.50 to 8.00
Stove plate	5.00 to 5.25
Railroad malleable	8.00 to 8.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$4.00 to $5.50
No. 2 heavy melting steel	3.50 to 4.00
Heavy melting steel (yard)	2.00
No. 1 heavy breakable cast	5.00 to 5.25
Stove plate (steel works)	2.50 to 2.90
Machine shop turnings	1.00 to 1.50
Short shoveling turnings	1.00 to 1.50
Cast borings	1.00 to 1.25
No. 1 blast furnace	1.00 to 1.25
Steel car axles	8.00 to 8.50
Spec. iron and steel pipe	$2.50 to $2.75
Forge fire	2.75 to 3.00
No. 1 railroad wrought	4.00 to 4.50
No. 1 yard wrought long	3.25 to 3.50
Rails for rolling	5.00 to 5.50
No. 1 cast	4.50 to 5.00
No. 2 cast	5.00 to 5.50
Stove plate (foundry)	4.50
Malleable cast (railroad)	4.00 to 4.50
Cast borings (chemical)	6.00 to 6.50
Per gross ton, delivered Izmal foundries:	
No. 1 machinery cast	$9.00
No. 1 hvy. rust (cupola size)	7.50 to 8.00
No. 2 cast	5.00 to 5.50

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$5.50 to $6.00
Scrap rails for melting	6.25 to 6.75
Loose sheet clippings	1.00 to 1.50
Bundled sheets	3.75 to 4.25
Cast iron borings	3.00 to 3.50
Machine shop turnings	3.00 to 3.50
No. 1 busheling	4.50 to 5.00
No. 2 busheling	2.75 to 3.25
Rails for rolling	6.75 to 7.25
No. 1 locomotive tires	7.25 to 7.75
Short rails	9.25 to 9.75
Cast iron carwheels	6.50 to 7.00
No. 1 machinery cast	6.50 to 7.00
No. 1 railroad cast	6.00 to 6.50
Burnt cast	4.25 to 4.75
Stove plate	4.50 to 5.00
Agricultural malleable	7.00 to 7.50
Railroad malleable	7.25 to 7.75

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting steel	$6.00 to $6.50
Borings and short turnings	4.50 to 5.00
Long turnings	3.00 to 3.50
No. 1 machinery cast	7.75 to 8.25
Automotive cast	9.00 to 9.50
Hydraul. comp. sheets	5.75 to 6.25
Stove plate	3.00 to 3.50
New No. 1 busheling	5.00 to 5.50
Old No. 2 busheling	3.50 to 4.00
Sheet clippings	2.75 to 3.25
Flashings	4.25 to 4.75

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	4.00	3.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	12.50	10.00
Stove plate	10.00	8.00
Standard carwheels	10.00	8.50
Malleable	10.00	8.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	2.95c.
Squares and flats	2.45c.
Hoops and bands, under ¼ in.	2.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.10c.
Galv. sheets (No. 24), 25 or more bundles	3.35c.
Hot-rolled sheets (No. 10)	2.65c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	$3.61
Spikes, large	2.40c.
Small	2.65c.
Boat	2.90c.
Track bolts, all sizes, per 100 count,	70 per cent off list.
Machine bolts, 100 count,	70 per cent off list.
Carriage bolts, 100 count,	70 per cent off list.
Nuts, all styles, 100 count,	70 per cent off list.
Large rivets, base per 100 lb.	$3.00
Wire, black, soft ann'l'd, base per 100 lb.	2.65
Wire, galv. soft, base per 100 lb.	3.10
Common wire nails, per keg	2.20
Cement coated nails, per keg	2.20

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforc. bars, billet steel	1.55c. to 1.70c.
Rail steel reinforcement	1.30c. to 1.45c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.00c.
Flats and squares	3.50c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.45c.
Galv. sheets (No. 24)	3.50c.
Hot-rolled sheets (No. 10)	2.75c.
Spikes (3/16 in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural (keg lots)	2.75c.
Rivets, boiler (keg lots)	2.75c.
	Per Cent Off List
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq., tap. or blank	65
Hot-pressed nuts, hex., tap. or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotters	60 and 10
Stove Bolts	80
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.50
Cement c't'd nails, base per keg	2.30

NEW YORK

	Base per Lb.
Plates and struc. shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	5.75c. to 6.25c.
Cold-fin. shafting and screw stock;	
Rounds and hexagons	3.54c.
Flats and squares	4.04c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.30c.
Bands	3.30c.
Hot-rolled sheets (No. 10)	2.60c.
Hot-rolled ann'l'd sheets (No. 24*)	3.25c.
Galvanized sheets (No. 24*)	3.50c.
Long terne sheets (No. 24)	4.50c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel ⅝ x ½ in. and larger; Smooth finish, 1 to 2½ x ¼ in. and larger	3.40c. 3.75c.
Open hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.60
Machine bolt, cut thread:	Per Cent Off List
¾ x 6 in. and smaller; 1 x 30 in. and smaller	65 to 65 and 10 65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller; ¾ x 20 in. and smaller	65 to 65 and 10 65 to 65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.36c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.00c.
Hot-rolled sheets (No. 10) up to and inc. 48 in. wide	3.00c.
over 48 in. wide	3.15c.
Black corrug. sheets (No. 24)	3.75c.
Galv. corrug. sheets	4.05c.
Structural rivets	4.00c.
Boiler rivets	4.00c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex., blank or tapped, 00 lb. or more	65
Less than 200 lb.	55

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.45c.
*Structural shapes	2.45c.
*Soft steel bars, small shapes, iron bars (except bands)	2.45c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-finished steel bars	3.35c.
*Steel hoops	3.00c.
*Steel bands, No. 12 to 3/16 in., incl.	2.75c.
Spring steel	5.00c.
†Hot-rolled annealed sheets (No. 24)	3.15c.
†Galvanized sheets (No. 24)	3.50c.
*Hot-rolled annealed sheets (No. 10)	2.70c.
Diam. pat. floor plates, ¼ in.	5.00c.
Swedish iron bars	5.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

* Base prices subject to deductions on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. steel bars	2.95c.
Flat rolled steel under ¼ in.	3.00c.
Cold-finished strip	5.55c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galvanized sheets (No. 24)	3.50c.
Hot-rolled sheets (No. 10)	3.00c.
Black ann'l'd wire, per 100 lb.	$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.10

* Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex.	3.32c.
Squares and flats	3.32c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	3.55c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$15.87
4-in.	34.57
Lap-welded steel boiler tubes, 2-in.	15.12
4-in.	32.96

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.20c.
Soft steel bars	2.95c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.00c.
Rounds and hex.	3.00c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.35c.
Galv. sheets (No. 24)	3.75c.
Bands	3.30c.
Hoops	3.55c.
Hot-rolled sheets (No. 10) 48-in. and narrower	3.00c.
Wider than 48-in.	3.25c.
Com. wire nails, base per keg	$2.40
Black wire, base per 100 lb.	3.35

BOSTON

	Per Lb.
*Beams, channels, angles, tees, zees	3.00c.
*H beams and shapes	3.00c.
*Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	3.00c.
Floor plates, diamond pattern	5.25c.
*Bar and bar shapes (mild steel)	2.90c.
*Bands 3/16 in. thick and No. 12 ga. incl.	3.40c.
Hoops, No. 14 ga. and lighter	4.90c. to 5.40c.
*Half rounds, hf. ovals, ovals and bevels	4.15c.
Tire steel, rd. edge 1½ x ⅛ in. and larger	4.50c.
Smaller sizes	4.75c.
Cold-finished rounds and hexagons	3.60c.
Cold-rolled strip steel	5.20c.
Cold-finished squares and flats	4.10c.
*Blue annealed sheets, No. 10 ga.	3.15c.
One pass cold-rolled sheets No. 24 ga.	3.50c.
Blued stove pipe sheets, No. 24 ga.	3.90c.
Galvanized sheet sheets No. 24 ga.	4.00c.
Lead coated (long ternes) No. 24 ga.	5.00c.
Black wire, base per 100 lb., 2500 lb. or less	3.35c.
Over 2500 lb.	3.25c.

* Base prices for 15,000 lb. orders, extras apply for smaller quantities.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	3.15c.	3.20c.	3.00c.
Soft steel bars	3.15c.	3.20c.	3.00c.
*Reinforcing bars	3.00c.	3.00c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.70c.	4.20c.	4.25c.
Hot - rolled sheets (No. 10)	3.07½c.	3.80c.	3.50c.
Galv. sheets (No. 24)	4.30c.	4.50c.	4.75c.
*Struc. rivets, ½ in. and larger	5.75c.	6.00c.	5.25c.
*Cold finished steel Rounds	5.50c.	5.50c.	5.50c.
Squares and hexagons	6.75c.	6.75c.	6.75c.
Flats	7.25c.	7.25c.	7.25c.
Nails—base per keg less carload:			
Com. 4-60d.	$2.40	$2.40	$2.10
S. or 4-20d.	2.40	2.40	2.40
Finish 6 & 8d.	2.40	2.40	2.40
All others	2.65	2.65	2.65

* Subject to deductions for quantity.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Pan-American Petroleum & Transport Co., 122 East Forty-second Street, New York, has taken option 450-acre tract on Houston ship channel, Houston, Tex., as site for new oil refinery. Plans include group of buildings, with large battery of steel tanks, power house, pumping plant and machine shop. Part of plant will be given over to gasoline production. Entire project will cost about $7,000,000. Company is a subsidiary of Standard Oil Co. of Indiana, Chicago.

Long Island Casket Co., 49-83 Forty-seventh Street, Long Island City, has plans for two-story shop addition, 25 x 100 ft. Cost close to $24,000 with equipment. V. Schiller, 30-64 Forty-first Street, is architect.

Improved Devices, Inc., Brooklyn, has been organized by Louis T. Weiss, 768 Pacific Street, city, and Charles D. Purtzman, 70 Pine Street, New York, to manufacture mechanical equipment and devices.

Morris & Co., 631 Brook Avenue, Bronx, New York, meat packers, plan rebuilding part of branch packing plant recently destroyed by fire. Loss over $35,000 with equipment. Headquarters are at Chicago.

New York Central Railroad Co., Grand Central Terminal, New York, has advanced working force at repair shops at West Albany, N. Y., to about 2000 men, representing peak employment at plant for several years. Increased schedule will also be arranged at car shops at Gardenville, East Buffalo, reinstating over 300 men.

Constructing Quartermaster, Mitchel Field, L. I., asks bids until May 11 for coal storage plant and system, and utilities. Appropriation of $62,200 is available (Specification 9419-D).

Continental Can Co., 1 Pershing Square, New York, let general contract to J. B. Townsend, Post-Dispatch Building, Houston, Tex., for new one-story plant, 140 x 160 ft., at Houston, with foundations for two additional stories later. Initial cost about $100,000 with machinery. R. J. Cummins, Bankers' Mortgage Building, Houston, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 2 for six lubricating oil pumps (Schedule 9937), twisted-pair telephone cable and flame-proof cable (Schedule 9960), one gasoline-operated truck crane (Schedule 9954), four mechanical exhaust fans (Schedule 9955) for New York Navy Yard; until May 9, 8850 steel packing boxes for smokeless powder (Schedule 9969) for White Plains, N. Y., Naval Station.

Haulmor Mfg. Co., Inc., Brooklyn, has been organized by Samuel Pulaski, 1290 East Nineteenth Street, and Joseph Kruger, 2045 Batchelda Street, to manufacture engines, motors, parts, haulage equipment, etc.

David Mayer Brewery, 3548 Third Avenue, New York, inactive for several years, has been acquired by new interests, headed by Warren Smadbeck, 221 West Fifty-seventh Street. Plant will be remodeled and additional equipment installed. Cost over $125,000 with machinery. New company will be organized.

Wilson-Jones Co., 3300 Franklin Boulevard, Chicago, manufacturer of loose-leaf devices and equipment, has asked bids on general contract for one-story branch plant, 150 x 450 ft., at Elizabeth, N. J. Cost about $75,000 with equipment. Leo F. Caproni, 472 Elm Street, New Haven, Conn., is architect.

Beer Servador, Inc., Newark, N. J., recently organized to manufacture beer servicing equipment, has leased floor at 101 Peddie Street, for parts production and assembling.

Airwings, Inc., Newton, N. J., has been organized by F. A. Hood, Newton, and associates, capital $125,000, to manufacture airplanes and parts.

Fairmount Lamp Mfg. Co., Sixth Street and Fairview Avenue, Philadelphia, manufacturer of electric lamps, has purchased four-story factory at 2021-29 Naudain Street for new plant.

Reading Brewing Co., Reading, Pa., plans expansion and modernization program, including equipment. Cost over $50,000 with machinery.

Frick Co., Waynesboro, Pa., is expanding line of refrigerating and mechanical-cooling equipment for breweries, to include 14 sizes of low pressure units.

National Brewing Co., Steelton, Pa., has been acquired by new interests, represented by Benjamin G. Helsel, Middletown, Pa., and will be reopened soon. Expansion and improvements will be made, including new equipment.

Flock Brewing Co., Williamsport, Pa., is planning enlargements, with installation of additional equipment. Cost over $80,000 with machinery. Company is disposing of stock issue of 63,530 shares, part of fund to be used for work.

Dolomite Marine Corpn., Rochester, N. Y., has been organized by John H. Odenbach, 323 Aberdeen Street, and Charles P. Odenbach, 22 Mayflower Drive, capital $500,000, to manufacture marine engines, motors, parts, etc. Company will be identified with Dolomite Products Co., 183 Main Street.

Sawyer Refining Co., Inc., Bolivar, N. Y., let general contract to Miles P. Brown Boiler Works, Franklin, Pa., for new oil refinery at Wellsville, N. Y. Plant will include pipe mill, fractioning tower, stripping tower, storage and distribution tanks, etc. Cost over $250,000 with equipment. Wallace E. Sawyer is president.

William Laidlaw, Inc., Belmont, N. Y., maker of metal-cutting band saws, has been purchased by Leon G. Rogers, Cleveland, and Fred Winterhalter, a former employee of William Laidlaw, Inc. New company, which will announce its name later, has elected following officers: Leon G. Rogers, president; Fred Winterhalter, vice-president and general manager; Pearl C. Winterhalter, treasurer, and Edward N. Conrad, secretary.

Pfaudler Co., Rochester, N. Y., reports a sharp pick-up in business in its products, glass-lined tanks and other equipment used in dairy, brewing and other industries. Although major part of business of Pfaudler Co. is with dairy industry, there has been a substantial improvement in volume of business from brewing industry.

Quasi-Arc, Inc., which has maintained an office at 11 West Forty-second Street, New York, has moved to a plant at New Brunswick, N. J., where it will soon begin manufacture of electrodes. Company's new address is P. O. Box No. 54, New Brunswick, N. J. B. K. Matthews is secretary.

Newark Steel Treating Co., recently organized by F. E. Smith, for many years with the Crucible Steel Co. of America, has leased building at 283-289 Thomas Street, Newark. Company will do nitriding, cyaniding and other kinds of heat treating.

CENTRAL DISTRICT

United Natural Gas Co., Sharon, Pa., has plans for one-story mechanical shop on Penn Avenue. Cost about $23,000 with equipment.

Valley Mead Brewing Co., Meadville, Pa., has been organized to take over local plant of French Creek Brewing Co. Plans are under way for extensions and improvements, with additional equipment. Cost about $250,000 with machinery. P. J. Corll, Youngstown, Ohio, is president of new company.

Michael L. Fesenmeier, Cumberland, Md., is planning expansion and modernization at brewing plant at Huntington, W. Va., including new machinery. Cost over $200,000 with equipment.

Sloan & Zook Co., Bradford, Pa., manufacturer of oil products, has purchased refinery of Swan-Finch Oil Corpn., Warren, Pa., with rated capacity of 1000 bbl. daily. Subsidiary will be formed under name of Sloan & Zook Refining Co., to take over plant and carry out expansion.

John C. Virden Co., 6103 Longfellow Avenue, Cleveland, manufacturer of electric lighting fixtures and equipment, has leased 5000 sq. ft. additional floor space for branch plant at Toronto, operated under name of John C. Virden Co., Ltd., and will increase output.

Upper Sandusky Brewing Co., Upper Sandusky, Ohio, is planning expansion and modernization, including additional equipment. Cost over $70,000 with machinery.

City Council, Oberlin, Ohio, is disposing of bond issue of $250,000, fund to be used for new municipal electric light and power plant, with Diesel engine-generating units and auxiliary equipment. R. Husselman, Hippodrome Building, Cleveland, is consulting engineer. L. A. Sears is city manager.

Architectural Metals Corpn., Cleveland, care of Reuel A. Lang, 1548 Standard Bank Building, has been organized by Warner J. Devoe, Cleveland, and associates, to manufacture sheet and ornamental iron and metal products.

Miami Valley Brewing Co., Dayton, Ohio, operating former local Dayton Brewing Co., has been acquired by new interests, represented by Philmore J. Haber, Dayton. Extensions and improvements will be made including additional equipment. Cost over $85,000 with machinery.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until May 1 for one precision bench type milling machine (Circular 524); until May 3, 40 solenoid assemblies (Circular 531), 200 tachometer drive adapter assemblies (Circular 537); until May 8, ejection container assemblies and link ejection container assemblies (Circular 523), brass couplings, union couplings, 4000 bronze elbows, 4000 union elbows, 5000 nipples (Circular 486), air conditioning system installed complete in fuel test laboratory, Wright Feld (Circular 525), parachutes, parachute assemblies, loop assemblies, etc. (Circular 518), airplane equipment, including springs, cone assemblies, bomb shackle latch, bomb shackle link, etc. (Circular 538); until May 9, quantity of flexible conduit collars and flexible conduit ferrules (Circular 546); until May 10, 426 propeller blades (Circular 533), 96 propeller hub assemblies (Circular 532).

Greer Steel Co., Dover, Ohio, has increased operating schedule, adding about 140 men to working force.

Container Corpn. of America, Inc., 5500 Eastern Avenue, Cincinnati, manufacturer of corrugated paper boxes and containers, is planning extensions and improvements in power house, including two new boilers, stokers and accessory equipment.

Paranite Wire & Cable Co., Jonesboro, Ind., is increasing production schedule, with working force of 300 persons.

Utility Service Co., Continental Bank Building, Indianapolis, has plans for new electric light and power plant at Brazil, Ind. Cost about $500,000. It is proposed to lease to city for operation as municipal station. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

R. & W. Cam Co., Indianapolis, care of George A. Henry, Meyer Kiser Building, has been organized by Joseph E. Russo, Indianapolis, and associates, to manufacture cams, camshafts and other automotive equipment.

Menominee-Marinette Brewing Co., Menominee, Mich., is being organized to take over plant of United Beverage Co., and will make extensions and improvements, including new equipment, converting from soft drink to beer manufacture. Cost over $60,000 with machinery.

Hirschfield Pipe Reclamation Co., Bay City, Mich., has been organized by Joseph C. Hirschfield, 1414 North Madison Avenue, and associates, to operate foundry for manufacture of pipe, fittings and other iron castings.

Stroh Products Co., 909 East Elizabeth Street, Detroit, has filed plans for extensions and modernization in brewery, and will carry out work by day labor. Cost over $50,000 with equipment. Harley & Ellington, Stroh Building, are architects.

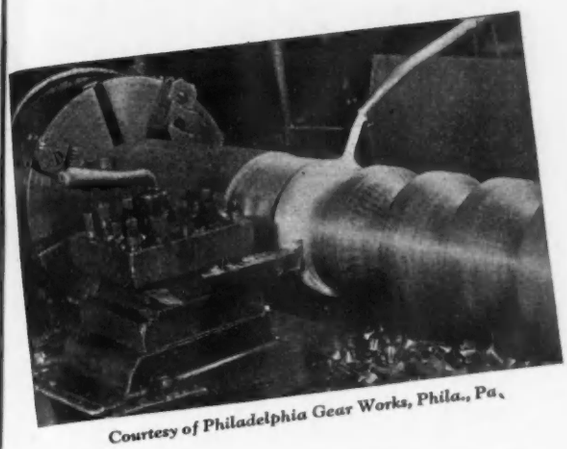
SOUTH ATLANTIC

Appleton Co., Anderson, S. C., plans extensions and improvements in steam power plant at cotton mill, including new equipment. Cost over $150,000 with machinery.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until May 9 for 47 cab assemblies and 47 vacuum tanks (Circular 101).

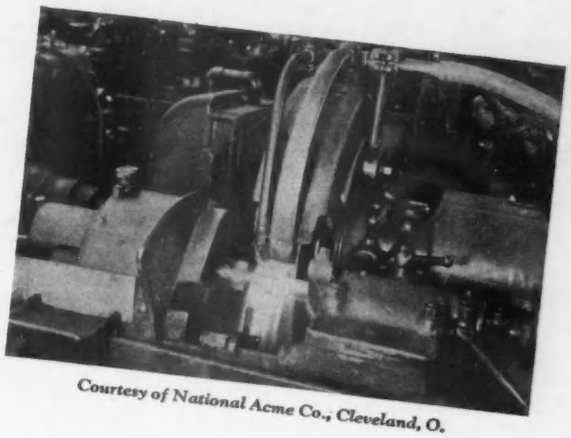
William Schluderberg-T. J. Kurdle Co., East Baltimore and Eaton Streets, Baltimore, meat packer, is planning one-story repair shop. Cost over $21,000 with equipment.

James H. Hensley, Jr., and E. M. Jarrett, Asheville, N. C., are organizing company to operate a brewing plant. Property has been acquired on Sweeten Creek Road and will be remodeled. Cost about $45,000 with machinery.



Courtesy of Philadelphia Gear Works, Phila., Pa.

OPERATION: TURNING GEAR BLANK.
MACHINE: LIBBY LATHE.
MATERIAL: STEEL FORGING.
CUT: 7/8 INCH; **FEED:** 1/32 INCH.
LUBRICANT: 1 PART SUNOCO TO 15 PARTS WATER.



Courtesy of National Acme Co., Cleveland, O.

OPERATION: GRINDING TWO DIAMETERS.
MACHINE: BROWN & SHARPE No. 30.
MATERIAL: TYPE EE STEEL FORGING.
WHEEL: 30 X 28 X 4 INCHES, R. P. M. 900.
COOLANT: 1 PART SUNOCO TO 40 PARTS WATER.

Economy Dictates *More Efficient* Cutting Lubricants

In your search for ways to lower machining costs, start with cutting oils. Sooner or later your investigations will bring you face to face with the practical (not just theoretical) economy of using an efficient cutting lubricant.

It is for this very reason—economy of production—that Sunoco Emulsifying Cutting Oil is widely and consistently used by leaders in the metal cutting industry. We suggest you treat Sunoco as a source of income. Watch its earning capacity. An accurate record of Machine Tool performance will tell you this.

Consider the increased speed and feeds permissible with Sunoco, the number of pieces per tool grind, the cost of tool maintenance and the accuracy and finish obtained throughout a long run. In addition, Sunoco will protect the finished parts from rust and corrosion.

Increased production, more satisfactory work, lower cutting costs and greater profits are all direct benefits of the lubricating and cooling qualities of Sunoco.

SUN OIL COMPANY, PHILADELPHIA, PA., U.S.A.

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SUNOCO
EMULSIFYING
CUTTING OIL

Made by the producers of BLUE SUNOCO MOTOR FUEL

Akron, Albany, Allentown, Atlantic City, Baltimore, Battle Creek, Beaumont, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Detroit, Flint, Grand Rapids, Harrisburg, Jackson (Mich.), Jacksonville, Miami, Montreal, Newark, New York, Philadelphia, Pittsburgh, Providence, Reading, Rochester, Scranton-Wilkes Barre, Syracuse, Tampa, Toledo, Toronto, Trenton, Wilmington, Youngstown and London, England.

Quartermaster, Langley Field, Va., asks bids until May 11 for central heating system, including pipe lines, etc. Appropriation of $54,000 is available. (Specification 9403-D).

General Purchasing Officer, Panama Canal, Washington, asks bids until May 2 for four riveting forges, 142 metal safety treads, pressure and vacuum gages, stair handrail brackets, steel ring bolts, 700 lb. cast iron welding rods, copper wire nails, steel reinforcing bars, rail clips and other equipment (Schedule 2860).

Bristol Steel & Iron Works, Bristol, Pa., is planning installation of a rotary bevel shear to handle stock up to ½-in.

Hickory Steel & Iron Co., Hickory, N. C., recently organized, will establish works in building on Tenth Avenue. New company is headed by J. O. Powers, Roanoke, Va., and R. L. McKaughan, Winston-Salem, N. C.

Marvo Products Machine Co., Remington Avenue and Thirtieth Street, Baltimore, has been organized by D. M. Heinicke and Huntington S. Hawkins, to manufacture machinery and mechanical equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 2 for one gasoline engine-driven crane, self-propelled, with swinging boom (Schedule 9918) for Pensacola, Fla., Navy Yard; 600 aircraft thermometers (Schedule 9930), 200 aircraft compasses (Schedule 9929) for Washington yard; one tractor with crane attachment (Schedule 9959) for Sewall's Point, Va., yard; one fire engine, combination booster, pump and hose car (Schedule 9961) for submarine base; 20 exhaust ventilation fans (Schedule 9978), fuses and fuse elements (Schedule 9919); until May 9, electric soldering irons (Schedule 9963) all for Eastern and Western yards; 30 electric searchlights and spare parts (Schedule 9944) for Brooklyn and Mare Island yards.

SOUTH CENTRAL

Common Council, Fort Thomas, Ky., has plans for municipal electric light and power plant and distributing system. Cost over $80,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Mengel Body Co., Louisville, manufacturer of automobile bodies, has advanced production schedule, doubling working force to about 500 men. Further early additions to working quota are planned.

Louisiana Dairy Products Corpn., New Orleans, has acquired existing plant at Crawley, La., and will remodel for new plant, with installation of tanks, conveyors and other equipment. Cost cover $30,000 with machinery.

Dolcito Quarry Co., Tarrant City, Ala., plans rebuilding part of plant and tipple recently destroyed by fire. Loss about $22,000 with equipment.

Common Council, Greensburg, Ky., plans installation of 150,000-gal. elevated steel tank and tower, low and high lift pumping machinery, filtration equipment, pipe lines, etc., in connection with extensions and improvements in waterworks. Appropriation has been arranged.

MIDDLE WEST

Corn Products Refining Co., Argo, Ill., has awarded general contract to Bedford Construction Co., 333 North Michigan Avenue, Chicago, for three-story addition. Cost about $90,000 with equipment. J. J. Merrill, Chicago address noted, is architect. Headquarters are at 17 Battery Place, New York.

Mutual Ice & Beverage Co., Twenty-second Street and Turner Avenue, Chicago, operating former plant of Mutual Brewing Co., plans expansion and improvements, including additional equipment. Cost over $75,000 with machinery.

Maremont Automotive Products, Inc., Chicago, has been organized to manufacture automobile springs and kindred automotive products, capital $272,500. New company will take over Maremont Mfg. Co., 1625 Ashland Avenue. Aaron L. Stein is one of principal incorporators.

Terry Carpenter, Scottsbluff, Neb., congressman, has secured 25-year franchise for electric light and power service. Plans will be drawn at once for electric generating plant and distributing system. Cost about $100,000 with equipment. Robert Fulton, 2327 South Nineteenth Street, Lincoln, Neb., is consulting engineer.

Minneapolis-Honeywell Regulator Co., Fourth Avenue South, Minneapolis, manufacturer of thermostatic controls, switches, valves, etc., has leased property on Peter Street, Toronto, for its subsidiary, Minneapolis-Honeywell Regulator Co., Ltd., Toronto, for new plant.

Philip Zang Brewing & Mfg. Co., Denver, Philip A. Zang, head, has plans for new multi-story brewery, with power house, pumping plant, refrigerating plant and other units. Cost about $750,000 with machinery.

Village Council, Virginia, Ill., W. J. Devlin, village clerk, plans installation of 60,000-gal. elevated steel tank and tower in connection with new waterworks. Cost about $100,000 with pipe lines, etc. Caldwell Engineering Co., Jacksonville, Ill., is consulting engineer.

National Metal Products Corpn., 4501 West Fillmore Street, Chicago, has been organized by Clarence V. Olsen and associates, to manufacture metal goods.

Geuder, Paeschke & Frey Co., 324 North Fifteenth Street, Milwaukee, manufacturer of stampings, enameled ware, etc., has acquired at receiver's sale property of Perfection Cooler Co., Michigan City, Ind., and will continue production at Milwaukee of beer coolers and dispensers. Geuder company is also reopening steel beer barrel division, which formerly handled large orders from Mexican breweries.

Pate Oil Co., Milwaukee, has been organized by William R. Pate and other former executives, Cities Service Co. of Wisconsin, and has acquired manufacturing and storage plant of Union Oil & Supply Co., 3640 West Leeds Place, to which it will add complete grease production unit. New company will specialize in industrial lubricants and specialties.

Northern Brewery Co., Eighth Street and Fisher Avenue, Superior, Wis., will remodel and re-equip its plant at cost of about $50,000, including new tanks, machinery, etc.

Wilson-Hurd Mfg. Co., Wausau, Wis., manufacturing aluminum name plates for machine tools, engines, electrical appliances, etc., reports business volume so far this year 74 per cent ahead of previous year.

Menominee-Marinette Brewing Co., 1910 Carney Avenue, Marinette, Wis., has announced appropriation of $50,000 for rehabilitation of plant, purchase of new tanks, machinery, etc. Walter E. Henes, 1417 Sheridan Road, Menominee, Mich., is president.

PACIFIC COAST

Wenzel & Henoch Construction Co., Fifth and California Streets, Beaumont, contractor for San Jacinto tunnel, Beaumont, Cal., has plans for one-story machine shop and mechanical works, 100 x 200 ft., for construction plant at Beaumont. Cost over $40,000 with equipment.

Humboldt Brewing Co., Eureka, Cal., has awarded general contract to Mercer-Fraser Co., Eureka, for plant extensions and improvements. New machinery will be installed. Cost about $200,000 with equipment.

City Department of Airports, City Hall, Los Angeles, has plans for one-story shop, 35 x 70 ft., at airport, Ingelwood-Redondo Road, Venice district. City Bureau of Construction, City Hall, in charge.

General Water Heater Corpn., 1107 North Highland Avenue, Los Angeles, manufacturer of water heaters, parts, etc., let general contract to Ted R. Cooper Co., 1031 South Broadway, for one-story machine shop, 50 x 60 ft., at Burbank, Cal.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 2 for about 17,250 lb. propeller shafting (Schedule 9932), one concrete mixing machine (Schedule 9950) for Mare Island Navy Yard.

Gambrinus Brewing Co., Portland, has been acquired by Northwest Brewing Co., Tacoma, Wash., Robert T. Knight, secretary. New owner plans expansion and modernization, including new equipment. Cost about $100,000 with machinery.

City Council, Crescent City, Cal., plans fund of about $200,000 for municipal water and power system, including pumping machinery, pipe lines, etc. E. J. Barry, Tacoma, Wash., is consulting engineer.

Industrial X-Ray Corpn., Los Angeles, has been organized, capital $250,000, by John W. Lucas and Paul J. Fritz, 808 Pacific Southwest Building, to manufacture X-ray precision equipment, parts, etc.

American Machine & Welding Works, 1017 West Broadway, Spokane, Wash., Peter A. Briggs, manager, has plans for new one-story plant. Cost about $22,000 with equipment.

NEW ENGLAND

Heveatex Corpn., 67 Maplewood Street, Malden, Mass., manufacturer of rubber products, has purchased seven factory units at Melrose, Mass., totaling 100,000 sq. ft. floor space, and will remove to new location and increase capacity.

Bee Machine Corpn., Lynn, Mass., has been organized by Vincent W. Burke, 434 Union Street, capital $100,000, to manufacture machinery and parts.

Eagle Brewing Co., Riverside Park, Waterbury, Conn., will make extensions and improvements, including new equipment. Cost over $60,000 with machinery.

Quartermaster, Fort Banks, Mass., asks bids until May 3 for a marine Diesel engine and auxiliary equipment for vessel (Circular 8).

J. W. Reichert, Worcester, Mass., has plans for two-story and basement meat-packing plant, 75 x 180 ft. Cost over $60,000 with equipment. Harry L. Meachan Associates, Inc., 120 Front Street, is architect in charge.

Standard Mfg. Co., Worcester, Mass., has been organized by Christine J. Batcheller, 235 Common Street, Watertown, Mass., and Hugh W. Batcheller, Worcester, to manufacture electrical equipment and supplies.

Town Water Board, Town Hall, Milton, Mass., plans erection of steel standpipe, pipe lines, etc., for waterworks expansion and improvement. Fund of $100,000 has been arranged. Metcalf & Eddy, Statler Building, Boston, are engineers.

SOUTHWEST

Falstaff Brewing Corpn., 3684 Forest Park Boulevard, St. Louis, has plans for two-story and basement addition, 98 x 119 ft., for new bottling works, in connection with expansion program, to cost $300,000. J. H. Groves, Boatmen's Bank Building, is architect.

Argus Gas Co., Hugoton, Kan., has approved plans for new gasoline refinery, including machinery for extraction of casinghead gasoline from natural gas; latter will be secured by pipe line from Stevens gas field. Cost about $100,000 with machinery.

Purchasing and Contracting Officer, Quartermaster Corps, Field Artillery School, Fort Sill, Okla., asks bids until May 3 for pipe, hose nipples, wire, galvanized pipe, nails, sewer rods, reinforcing steel and other supplies (Circular 36).

Arkansas Power & Light Co., Pine Bluff, Ark., plans rebuilding power substation at Newport, Ark., recently destroyed by fire. Loss over $80,000 with equipment.

State Board of Affairs, State Capitol Building, Oklahoma City, has secured appropriation of $200,000 for extensions and improvements in central steam power plant and heating system at State reformatory, Granite, Okla. W. C. Hughes is chairman.

City Council, Burlington, Kan., is arranging special election to approve bond issue of $118,000 for municipal electric light and power plant, to cost $85,000 with equipment, and distributing system, $33,000. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Acme Brass Foundry Co., San Antonio, Tex., has been organized by G. C. Margozewitz, 1406 Highland Street, and associates, to operate foundry for production of brass, bronze, aluminum and other metal castings.

Oil Refineries, Inc., Shreveport, La., is concluding arrangements for acquisition of gasoline refinery of Rusk Refining Co., Overton, Tex., capacity about 3500 bbl. daily, and plans expansion.

FOREIGN

Standard Oil Co. of New Jersey, 26 Broadway, New York, will carry out expansion program at oil refinery on Island of Aruba, Dutch West Indies, to include divisions for production of gasoline, lubricating oils and other oil products. Cost over $500,000 with equipment.

Hall Chemical Co., Ltd., London, England, manufacturer of industrial chemicals, etc., is planning establishment of branch plant at Montreal, Que. Cost close to $100,000 with equipment.

South Manchuria Railway Co., Mukden, Manchuria, is planning early organization of a subsidiary to erect new plant for manufacture of aluminum, near company collieries at Fushun and at Honkeiko, Manchuria. Initial work will consist of experimental unit, to cost about 200,000 yen (approximately $44,000), to be followed soon by large plant, costing over $500,000 with machinery.

New Trade Publications

Speed Changer.—Smith Power Transmission Co., Penton Building, Cleveland. Leaflet briefly describing the Johnson variable reducer by which any speed from zero up to 240 r.p.m. is obtainable by changing the stroke of five arms attached to one-way clutches.

Electric Motors.—General Electric Co., Schenectady, N. Y. Bulletin GEA-1195A, devoted to large synchronous motors for driving metal rolling mills, and bulletin GEA-1538, illustrating totally enclosed squirrel-cage units of ½ to 2 hp. capacity for use under adverse conditions as to atmosphere.

Tracks for Tractors.—Allis Chalmers Mfg. Co., Milwaukee. Folder showing drop-forged steel tracks for converting a track-type wagon into a tractor.

Steel Equipment.—Standard Pressed Steel Co., Jenkintown, Pa. Catalog describes steel stools, chairs and tables for factory, office and general use.

Expansion Joints.—Yarnall-Waring Co., Chestnut Hill, Philadelphia. Cylinder-guided expansion joints for use in power, heating and industrial plants where provision must be made for expansion and contraction in pipe lines are illustrated and described in Bulletin EJ-1904. Construction details, prices, weights and dimensions are included.

Leather Belting.—E. F. Houghton & Co., 240 West Somerset Street, Philadelphia. Fifteen-page booklet, descriptive of recently developed leather belting for industrial transmission.

Rustless Steels.—Electro Metallurgical Co., 30 East Forty-second Street, New York. Brief summary of major applications of rustless steels is interestingly presented in 19-page, illustrated brochure.

Gas Producers.—Semet-Solvay Engineering Corpn., 40 Rector Street, New York. Bulletin 45, 12 pages, is devoted to features and design of Koller type gas producers.

Synchronous Motors.—General Electric Co., Schenectady, N. Y. Economics of sychronous motors, general description of various types and operating characteristics and industrial applications are presented in 52-page, illustrated booklet.

Hot-Blast Process.—Air Preheater Corpn., Wellsville, N. Y. Bulletin 532, illustrated, presents features and equipment details of company's hot-blast process for cupolas. Heat economics of iron-melting cupola also discussed.

Automatic Controllers.—Johnston Mfg. Co., Minneapolis. Bulletin 1010 illustrates and describes valveless automatic controllers for atmosphere and temperature in oil-burning furnaces.

Dust Collectors.—Blaw-Knox Co., Pittsburgh. Construction features, supplementary equipment and table of dimensions and specifications covering frame bag dust collectors are incorporated in 15-page booklet.

Electric Locomotives.—Atlas Car & Mfg. Co., Cleveland. Catalog 1245, attractively bound, 96 pages, describes storage battery, combination and trolley locomotives, with section devoted to locomotive types according to use.

Sheet Piling.—Inland Steel Co., Chicago. Circular contains engineering data relating to tees, sections, corners, crosses and splices. Several typical installations are illustrated.

Boiler Nozzles.—Worth Steel Co., Claymont, Del. Plate steel boiler nozzles are described and illustrated in 12-page pamphlet, which includes tables of dimensions and list prices.

Wire Rope.—John R. Roebling's Sons Co., Trenton, N. J. Illustrated, 36-page booklet describes methods of splicing wire rope. Four types of splices are shown: standard long, Chicago or tied, thimble and long splice for ropes with independent wire rope center.

Crushers.—Traylor Engineering & Mfg. Co., Allentown, Pa. Bulletin 111 is devoted to various types of gyratory crushers. Construction details, sizes and approximate capacities are stated.

Indicators.—Bacharach Industrial Instrument Co., Pittsburgh. Bulletin 3266 discusses correct compression for Diesel safety and efficiency and presents design features of Maihak indicator, especially constructed for use on Diesel engines.

Boiler Feed Equipment.—Northern Equipment Co., Erie, Pa. Folder 127 illustrates and describes Copes type DA feed water regulator. Folder 129 describes Copes type SDS-2 governor.

Magnetic Separators.—Magnetic Mfg. Co., Milwaukee. Descriptive folder is devoted to Stearns type Q magnetic separator designed to separate eventually free iron from fine ground material.

Motors.—Ohio Electric Mfg. Co., Cleveland. Bulletin 211 contains line drawings illustrating special designs, giving dimensions and horsepower of company's special frame-design motors.

Propeller Fans.—Ilg Electric Ventilating Co., Chicago. Profusely illustrated booklet presents features, applications and many actual installations of company's line of self-cooled propeller fans.

Phosphor Bronze.—American Brass Co., Waterbury, Conn. Phosphor bronze, its physical properties, grades and commercial shapes, described in seven-page brochure.

Rolled and Formed Steel Sections—Truscon Steel Co., Youngstown, Ohio. Illustrated handbook, 71 pages, catalogs company's line of steel sections rolled and formed from plates, sheets, flats, bands and strips. Tables of dimensions, weights, prices, etc., are included.

Copies of booklets covering the steel castings symposium recently held under the sponsorship of the American Foundrymen's Association and the American Society for Testing Materials, can be secured from the Steel Founders' Society of America, Inc., 420 Lexington Avenue, New York, at cost plus postage.

The design of welded piping was recently discussed at length before a meeting of the American Welding Society and the petroleum and power divisions of the American Society of Mechanical Engineers, by F. S. G. Williams, of the Taylor Forge & Pipe Works. The paper has been reprinted in notably attractive form by the Taylor company, P. O. Box 485, Chicago. A feature of the paper is a description of tests of the friction of elbows, partly in relation to the kind and position of the welds.

Seneca Falls Machine Co., Seneca Falls, N. Y., has appointed Cadillac Machinery Co., Fisher Building, Detroit, as its exclusive representative in the Detroit district for the sale of Lo-swing and Short-Cut lathes and automatic loading devices. W. H. Nettle, formerly Western sales manager for the Seneca Falls Machine Co., is now connected with the Cadillac Machinery Co.

Witherite (natural barium carbonate), its uses and occurrence, are discussed in a treatise, reprinted in booklet form, by H. Conrad Meyer, vice-president in charge of production and research, Foote Mineral Co., Inc., Summer Street, Philadelphia. One of the advantages claimed for this relatively rare mineral is the saving in raw material cost effected by its use, in finely pulverized form, as a catalyst or energizer in case-hardening steel. Copies of the booklet can be obtained without charge from the Foote company.

Canada's Nickel Will Last 100 Years or More

In a recent address before the Canadian Institute of Mining and Metallurgy, Robert C. Stanley, president, International Nickel Co. of Canada, presented some interesting facts regarding the nickel industry, particularly Canadian production.

He stated that there is sufficient ore in Canada to carry the industry at the rate of its peak production in 1929 for the next hundred years. In an average year more than 90 per cent of all the nickel used throughout the world originates in Canada, there being probably no other metal of which so large a percentage is produced in one country and so small a percentage of that metal sold in the country of origin.

In the past five years Canadian companies have sold 203,000 tons of nickel, of which the United States consumed approximately 53½ per cent; Great Britain, 9½ per cent; Germany, 9½ per cent; France, 7½ per cent; Russia, 7 per cent; Japan, 3 per cent; Italy, 2½ per cent, while Canada, itself, consumed only one-half of 1 per cent.

Nickel is the largest export item of Canada in proportion to its production, more than 99 per cent being exported against 70 per cent of Canada's wheat, 45 per cent of her flour and 90 per cent of her newsprint paper.

Unfinished ship construction on March 31 aggregated less than 750,000 gross tons, according to the first quarter report issued by Lloyd's Register. This total is the lowest in more than 50 years, the report states, but represents a decline of only 24,000 tons during the first quarter, compared with a decrease of 135,000 tons in the quarter ended Dec. 31. Of the 10 leading shipbuilding nations only Denmark is now producing a smaller tonnage of merchant vessels than the United States. Only three merchant vessels of 20,000 tons or more are now being built: one each in Great Britain, the United States and France.

A new line of 3-hp. motors has been announced by the Emerson Electric Mfg. Co., St. Louis. The unit operates at 1725 r.p.m. and is furnished in the single-phase, repulsion start induction type, the polyphase squirrel cage type and direct current, compound wound. The shafts are of tool steel. Bearings are of bronze and are wool packed. Oil reservoirs are oversize to require only infrequent relubrication. The frames have ventilating openings and a fan on the armature shaft provides the circulation of air.

Publications

Hoover Dam is the title of a 16-page fully-illustrated bulletin just issued by the Babcock & Wilcox Co., 85 Liberty Street, New York. This describes briefly the Hoover Dam project as a whole and in greater detail the gigantic welded plate-steel pipes that are to be fabricated, and installed in the hydraulic power and normal-flow control tunnels. Among the illustrations in this bulletin are maps of the territory adjacent to Hoover Dam, sketches of the dam and pipe layout, photographs of the canyon and the tunnels as well as a drawing visualizing the size of a 30-foot diameter section of pipe weighing 150 tons—as heavy as many types of standard-gage railroad locomotives. Copies of this bulletin may be had by addressing requests to the Babcock & Wilcox Co. at its New York office.

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Firebrick for oil-fired furnaces, as well as fireclay bricks, high-temperature cements, and plastic refractories for boiler and stoker furnaces, and carbex silicon-carbide refractories for industrial and boiler furnace linings, are described in a new booklet issued by the McCleod & Henry Co., Troy, N. Y. The material for the oil-fired furnace linings is known as the Steel Mixture Oil brand.

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A pocket size diary is to be issued monthly, beginning with April, by the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., and it will be sent on request to any one having an interest in the use of titanium alloys. The April issue of the *TAM Daily Reminder* contains a brief article on the usefulness of titanium in steel making.

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The variety of uses that may be made of wire rope in the field of handling materials is brought out in a publication compiled by the MacWhyte Co., Kenosha, Wis. There are three distinct types of sling bodies shown in applications to illustrate "slings having the flexibility of chain and the safety of wire rope." Numerous tables give safe loads and incidental information for the different combinations, together with wire rope fittings.

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Electric welding is the subject of a Lehigh University publication for February. Four papers are reprinted in it under the authorship, among others, of Profs. Gilbert E. Doan and Wilber E. Harvey, of the metallurgical department of the university. Researches in arc welding, metal deposition of electric arc welding and a corrosion-fatigue study of welded low-carbon steel are covered. The publication is in pamphlet form, obtainable from Lehigh University, Bethlehem, Pa., at 20c. a copy.

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Procedure in the advance planning of public works is illustrated by studies made for the District of Columbia. A 28-page pamphlet on the subject has been published by the Federal Employment Stabilization Board for guidance in solving the problem in other localities, and the brochure is obtainable from the Superindendent of Public Documents, Washington, for 10c.

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Bench lathes, including underneath motor-drive type; floor-leg type Junior lathes, toolroom and new model general purpose lathes are described and illustrated in a 72-page general catalog, No. 93, recently issued by the South Bend Lathe Works, South Bend, Ind. Gap, brake drum and wood turning lathes are also shown. A wide variety of equipment, attachments and accessories are included.

Meetings

The ninth annual Eastern Safety Conference has been scheduled for May 4, at Newark, N. J. Increased compensation insurance rates and the need for reducing costs in industry will feature discussions at various sessions of the meeting. A number of local safety councils in New Jersey will participate in the conference. Other cooperative agencies will include the National Safety Council and the northern New Jersey chapter of the American Society of Safety Engineers.

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At the recent annual meeting of the Institute of Metals in London, England, Sir Henry Fowler was elected president of the institute; C. H. Desch and Prof. R. S. Hutton, vice-presidents; Sir Robert Dixon, Wesley Lambert, H. C. Lancaster, A. H. Mundey, A. J. G. Smout and F. Tomlinson, members of council. The silver jubilee meeting of the institute will be held in Birmingham, England, Sept. 18-21.

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The rise of the plastics industry is well indicated by an exhibition of plastic materials and their products opened in London, April 5, at the Science Museum, South Kensington. Nearly 80 industries, most of them of post-war birth, were represented by approximately 1000 exhibits. The display was arranged by the Society of the Chemical Industry in conjunction with the British Plastic Moulding Trade Association and the Department of Scientific and Industrial Research.

Trade Notes

Luria Brothers Co., Inc., scrap brokers, with main offices in Reading, Pa., will open a branch office in the Strauss Building, 310 South Michigan Avenue, Chicago, May 1. The office will be in charge of W. E. Richey, now with company in its Detroit office. With the establishment of the Chicago office, the company will have eight branches situated in the principal steel-making centers in Western and Eastern districts of the country. Mr. Richey, formerly associated with the Pennsylvania railroad, is vice-president of the Lake Ports Shipping & Navigation Co., Detroit and Chicago. He has been in the Detroit office of Luria Brothers since it was opened three years ago.

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Raymond Mfg. Co., Corry, Pa., manufacturer of springs and metal stampings, is celebrating its fiftieth anniversary. Founded in 1883 by M. M. Raymond, the company has designed and constructed many improved machines for producing high grade springs. F. M. Raymond has been president of the company since his father's death in 1909. F. E. Whittlesey, general manager, has been identified with the organization since 1891.

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Taylor & Co., Inc., Norristown, Pa., has announced the prospective opening on or about May 1 of its new plant, which will be devoted to the manufacture of vulcanized fibre, fish paper and laminated phenolic products, including noiseless gears. The executive personnel of the Taylor organization includes J. M. Taylor, president; L. T. McCloskey, sales manager, and C. N. Jacobs, plant manager.

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A radiographic service has been established by the Electro-Alloys Co., Elyria, Ohio, to detect any hidden flaws in Thermoalloy retorts, or salt, cyanide or lead pots, in the interest of correcting flaws and securing added service from the equipment besides saving time and labor that might be caused by an unexpected and inconvenient shut-down. The X-ray inspection service is counted on to develop higher production standards.

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Production of fluorspar in the United States in 1932 totaled 17,000 net tons, compared with 55,000 tons in 1931. Imports of fluorspar into this country last year amounted to 13,236 tons, valued at $132,665, a decrease of 36 per cent in tonnage and 37 per cent in total value from the totals for 1931. Imports were equivalent to 52 per cent of the total shipments of domestic fluorspar in 1932, contrasted with 39 per cent in the preceding year.